Systems and
Options Catalog

July 1992

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Digital Systems and Options Catalog

July 1992

Highlights of what's new in this catalog . . .

Chapter 1

- VAXstation 4000 Model 90 Workstation
- MicroVAX 3100 Model 90 Systems and Servers
- VAX 4000 Models 100, 400, 600 Systems and Servers
- VAX 7000 Systems and Servers
- VAX 10000 Systems and Servers

Chapter 7

- DECarray 400 DSSI Storage Array
- ESE50 Solid-State Disk Storage System
- RF31T DSSI Integrated Storage Element
- RZ24L SCSI Disk Drive
- RZ26 SCSI Disk Drive
- StorageServer 100 Optical Storage System
- Tx86 Family of Tape Drives
- TLZ06 SCSI DAT Tape Drive
- TKZ09 SCSI Helical Scan Tape Drive

Chapter 8

- LA424 MultiPrinter

See the Table of Contents for new organization.

VMS Renamed to OpenVMS

OpenVMS is now the official name for VMS, reflecting the many de facto and industry standards that have always been part of VMS, along with the addition of new open features such as POSIX and X/Open branding. OpenVMS is the industry leader in the integration of multivendor computing environments. This edition begins the transition in terminology.

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Preface

Digital Equipment Corporation publishes the *Digital Systems and Options Catalog* (formerly the *VAX Systems and DECsystems Systems and Options Catalog*) quarterly as a hardware ordering and configuring guide. It is a comprehensive collection of current descriptive, ordering, and configuring information available on systems and hardware options. This catalog presents only those products that are announced, actively marketed, and available for ordering during this quarter.

How To Use This Catalog

This catalog provides ordering and configuring information for new system sales. If necessary, past editions should be retained for reference. The following describes how the catalog is organized.

The first four chapters—Chapter 1, *VAX Systems;* Chapter 2, *DECsystems* (RISC); Chapter 3, *Personal Computing*; and Chapter 4, *Specialized Systems*—provide systems information, such as product descriptions, illustrations, and menus to assist in ordering and configuring the various systems.

The remaining chapters provide more detail, such as product descriptions, features, and ordering and configuring information for many of the options presented or referred to in the system menus. It is not possible, in many instances, to provide complete ordering information for all of the various options on each menu; hence, the references to other chapters.

Chapter 5, *VAXcluster Options/System Expansion,* includes VAXcluster configuration rules, memory, environmental products and additional expansion information. Chapter 6, *Networks, Communications, and Cables* is organized into five categories—LAN communications controllers, local and wide area communications controllers, host-based communications controllers, network connectivity products, and cables. Terminal server and router summary charts are included. For complete networking and communications information, refer to the *Networks Buyer's Guide.* Chapter 7, *Storage Devices,* provides information on various controllers, disk drives, and tape, optical, and CD-ROM drives. Chapter 8, *Terminals and Printers,* contains helpful selection charts in addition to the ordering information. Chapter 9, *Software and Services,* includes brief descriptions of many software products developed by Digital as well as information about many of Digital's service offerings. Other sources of information are the *VAX VMS Software Source Book, ULTRIX Software Source Book,* and Software Product Descriptions (SPDs), and *The U.S. Systems Price List* or appropriate country price list.

The following catalogs are also available and may be used for additional information.

- *Networks Buyer's Guide*
- *VAX VMS Software Source Book*
- *ULTRIX Software Source Book*
- *Network Application Support (NAS) Application Catalog*
- *DECdirect Catalog*
- *Personal Computing Integration Software and Hardware Catalog*
- *Digital Systems and Options Catalog for Realtime/PDP-11 Products*

Digital makes every effort to provide this catalog at the beginning of each quarter. However, if major new systems are scheduled to be announced early in a given quarter, we may alter the schedule to incorporate those products.

We value your comments and suggestions. Please fill out the reply card found at the back of this catalog.

Chapter 1
VAX Systems

VAX Systems Comparison Chart

VAXstation 4000 Workstations

MicroVAX 3100 Systems and Servers

VAX 4000 Systems and Servers

VAX 6000 Systems and Servers

VAX 7000 Systems and Servers

VAX 10000 Systems and Servers

VAXft Systems and Servers

ACCESSWORKS Data Integration Servers

VAX Systems Comparison Chart

System	VAXstation 4000 VLC, Models 60 and 90	MicroVAX 3100 Models 30, 40, 80, and 90	VAX 4000 Model 100	VAX 4000 Models 400, 500, and 600
Performance	VLC: 6.2 SPECmark Model 60: 12 SPECmark Model 90: 32.8 SPECmark	Models 30 and 40: 22 TPS Model 80: 28 TPS Model 90: 34 TPS	51 TPS	Model 400: 51 TPS Model 500: 68 TPS Model 600: 102 TPS
Relative Processor Performance × VAX-11/780[1]	N/A	Models 30 and 40: 5 Model 80: 10 Model 90: 24	24	Model 400: 16 Model 500: 24 Model 600: 32
Number of Processors	1	1	1	1
CPU Clock Speed	VLC: 25 MHz Model 60: 55 MHz Model 90: 72 MHz	Models 30 and 40: 25 MHz Model 80: 50 MHz Model 90: 72 MHz	72 MHz	Model 400: 63 MHz Model 500: 72 MHz Model 600: 83 MHz
Cache Size	VLC: 8 KB on chip; Models 60 and 90: 2 KB on chip, 256 KB on board	Models 30 and 40: 6 KB on chip; Model 80: 2 KB on chip, 256 KB on board; Model 90: 10KB on chip, 128 KB on board	8 KB on chip, 128 KB on board	Model 400: 8 KB on chip, Model 500 and 600: 10 KB on chip; Models 400 and 500: 128 KB on board, Model 600: 512 KB on board
In-Cabinet CPU Upgrade	Model 60 upgrades to Model 90	Model 40 upgrades to Model 80 or Model 90; Model 80 upgrades to Model 90	N/A	Each VAX 4000 system upgrades to any higher VAX 4000 system
Alpha-Ready System Upgrade	Models 60 and 90: system upgrade to Alpha desktop and deskside workstations	Models 80 and 90: system upgrade to Alpha desktop system	System upgrade to Alpha desktop system	System upgrade to Alpha distributed/departmental system
I/O Features				
Maximum Memory Capacity	VLC: 24 MB Model 60: 104 MB Model 90: 128 MB	Models 30 and 40: 32 MB Model 80: 72 MB Model 90: 128 MB	128 MB	512 MB
Maximum Disk Capacity	VLC: 8.4 GB Models 60 and 90: 8.7 GB	8.7 GB	28 GB	56 GB
Maximum I/O Throughput	VLC: 5.0 MB/s; Models 60 and 90: 5 MB/s (SCSI), 50.0 MB/s (TURBOchannel)	4 MB/s	8.5 MB/s	12.5 MB/s
I/O Support	VLC: Synchronous SCSI, Ethernet; Models 60 and 90: Synchronous SCSI, Ethernet, TURBOchannel	1 SCSI, 1 Ethernet	3 DSSI (1 embedded, 2 Q-bus), 1 Q-bus, 1 SCSI, 3 Ethernet	4 DSSI (2 embedded, 2 Q-bus), 2 Q-bus, 3 Ethernet
High Availability Features				
VAXcluster System Support	Ethernet	Ethernet	Ethernet, DSSI	Ethernet, DSSI
High Availability Features Supported	Disk shadowing	Disk shadowing	Disk shadowing, online hardware/software service upgrade	Disk shadowing, online hardware/software service upgrade
Software Features				
System Software	VLC and Model 60: OpenVMS and VAXeln; Model 90: OpenVMS	OpenVMS	OpenVMS	OpenVMS
Network Application Support Software	NAS 250	NAS 200, 300, 400	NAS 200, 300, 400	NAS 400

[1] VAX-11/780 = 1

N/A = not applicable

Performance is highly dependent on configuration, application, and operating environment. Individual workloads should be carefully evaluated before making performance estimates for specific applications. In this chart no warranty of system performance is expressed or implied.

Details on configurations are found in this catalog.

VAX Systems Comparison Chart

System	VAXft Systems Models 110 through 612	VAX 6000 Models 510 and 610	VAX 7000 Models 610 to 640	VAX 10000 Models 610 to 640
Performance	Model 110: 10 TPS Models 410 and 610: 18 TPS Model 612: 31 TPS	Model 510: 50 TPS Model 610: 101 TPS	Model 610: 123 TPS Others: N/A	Model 610: 123 TPS Others: N/A
Relative Processor Performance × VAX-11/780[1]	Model 110: 3.8 Model 410: 6 Model 610: 6 Model 612: 12	Model 510: 13 Model 610: 32	Model 610: 35 Model 620: up to 65 Model 630: up to 95 Model 640: up to 125	Model 610: 35 Model 620: up to 65 Model 630: up to 95 Model 640: up to 125
Number of Processors	Models 110, 410, 610: 2×2 redundant processors; Model 612 equals two Model 610s	1	Model 610: 1 Model 620: 2 Model 630: 3 Model 640: 4	Model 610: 1 Model 620: 2 Model 630: 3 Model 640: 4
CPU Clock Speed	Model 110: 16 MHz; Models 410, 610, and 612: 28 MHz	Model 510: 63 MHz Model 610: 83 MHz	91 MHz	91 MHz
Cache Size	Model 110: 1 KB on chip, 32 KB on board; Models 410 and 610: 6 KB on chip, 128 KB on board; Model 612: equals two Model 610s	Model 510: 2 KB on chip, 512 KB on board; Model 610: 10 KB on chip, 2 MB on board	10 KB on chip/processor 4 MB on board/processor	10 KB on chip/processor 4 MB on board/processor
In-Cabinet CPU Upgrade	N/A	Each VAX 6000 system upgrades to any higher VAX 6000 system	Each VAX 7000 system upgrades to any higher VAX 7000 system	Each VAX 10000 system upgrades to any higher VAX 10000 system
Alpha-Ready System Upgrade	N/A	System upgrade to Alpha data center system	In-cabinet CPU upgrade to Alpha data center system	In-cabinet CPU upgrade to Alpha mainframe-class system
I/O Features				
Maximum Memory Capacity	Model 110: 96 MB Models 410 and 610: 256 MB Model 612: 512 MB	Model 510: 512 MB Model 610: 1 GB[2]	3.5 GB[2]	3.5 GB[2]
Maximum Disk Capacity	Model 110: 4 GB Model 410: 24 GB Model 610 and 612: 48 GB	Over 8 TB	Over 10 TB	Over 10 TB
Maximum I/O Throughput	Models 110 and 410: 8 MB/s Models 610 and 612: 16 MB/s	80 MB/s	400 MB/s	400 MB/s
I/O Support	Model 110: 2 DSSI, 4 (2 redundant) Ethernet; Model 410: 2 DSSI, 8 (4 redundant) Ethernet; Models 610 and 612: 4 DSSI, 8 (4 redundant) Ethernet	1 XMI, 4 CI, 12 DSSI, 2 FDDI, 6 Ethernet, 5 VAXBI, 2 VME	4 XMI, 10 CI, 24 DSSI, 8 FDDI, 16 Ethernet, 1 VAXBI[3], 2 VME	4 XMI, 10 CI, 25 DSSI, 8 FDDI, 16 Ethernet, 1 VAXBI, 2 VME
High Availability Features				
VAXcluster System Support	Ethernet, DSSI	Ethernet, DSSI, CI, FDDI	Ethernet, DSSI, CI, FDDI	Ethernet, DSSI, CI, FDDI
High Availability Features Supported	Disk shadowing, uninterruptible power system, battery backup, full hardware redundancy, automatic transparent online reconfiguration, online hardware/software service upgrade	Disk shadowing, online hardware/software service upgrade	Disk shadowing, N+1 redundant power system, uninterruptible power system, battery backup, online hardware/software service upgrade	Disk shadowing, N+1 redundant power system, uninterruptible power system, battery backup, mainframe-class service, online hardware/software service upgrade
Software Features				
System Software	OpenVMS	Model 510: OpenVMS, ULTRIX Model 610: OpenVMS	OpenVMS	OpenVMS
Network Application Support Software	NAS 200, 300, 400	NAS 200, 300, 400	NAS 200, 300, 400	NAS 400

[2] 512 MB available now, higher capacities available with upcoming release of OpenVMS and higher density memory modules

[3] Supported by upcoming release of OpenVMS

Performance is highly dependent on configuration, application, and operating environment. Individual workloads should be carefully evaluated before making performance estimates for specific applications. In this chart no warranty of system performance is expressed or implied.

Details on configurations are found in this catalog.

VAXstation 4000 VLC Systems



Product Description

Starting at prices on par with PCs, VAXstation 4000 VLC offers an affordable and attractive graphical user interface with fast native graphics and CPU performance similar to the fastest VAXstation 3100. The VLC is an alternative to a text terminal. Terminal users can achieve an immediate increase in their productivity using a low-cost workstation running their current applications under DECwindows Motif. The 2.5-inch system box supports a maximum of 24 Mbytes of memory and includes a bracket for an optional RZ23L or RZ24L hard disk drive. System supports a variety of monitors: 13-inch, 16-inch, and 19-inch color and 17-inch and 19-inch grayscale. Audio input and output capability are included. VLC systems come equipped with thick wire Ethernet, one DEC-423 serial line, and one EIA-232D serial line with modem control.

Additional storage expansion options are available externally via a synchronous SCSI controller which increases SCSI throughput by up to a factor of 3 times that of the asynchronous SCSI controller. Three external expansion boxes can be connected to the VLC. The following options are supported in SZ03, SZ12 or SZ16 expansion boxes: TZ30, TLZ06, and TZK10 tapes; RX26 and RRD42 removable media; and RZ23, RZ23L, RZ24L, RZ25, RZ55, RZ56, RZ57, RZ58 hard disk drives.

Software licenses included are: VAX VMS and Network Application Support—NAS 250 for VAXstations: ACA, DECwindows Motif, DECnet-VAX (end-node), Extensions to DECnet-VAX, VMS/ULTRIX Connection (TCP/IP, RPC, NFS, Telnet), and VAXcluster. Systems ordered with a disk will have the base operating system, VMS, DECwindows Motif, VAXcluster, and DECnet factory installed.

With the addition of DEC SoftPC, Digital's PC emulator, or with native applications such as Lotus 1-2-3, dBASE IV and WordPerfect, the VAXstation 4000 VLC becomes a legitimate alternative to PCs in the VAX VMS environment.

Upgrades are available for prior generation of workstations, VAXstation 2000 and 3100 systems. Target applications for VLC are: low-end CASE, desktop publishing, office automation, low-end CAD, medical/hospital, and shop floor control.

Step 1—Systems

- Select system. 120-V systems include a U.S. keyboard and all required power cords. If a 240-V system is selected, the appropriate country kit or keyboard and power cord are required from Step 2.
- Field-installable options ship separately for installation at customer site. Select factory-installed options for custom systems.

VAXstation 4000 VLC Custom Systems include

- Base module
- Memory—six SIMM connectors
- Thick wire Ethernet controller on base system module
- Synchronous SCSI controller on base system module
- 2D graphics accelerator
- 8-plane color/grayscale graphics board
- Monitor (VRM17, VR319 = monochrome; VRT13, VRT16, VRC16, VRT19 = color)
- U.S. keyboard, 120-V systems only
- Mouse
- One DEC-423 serial line
- One EIA-232D serial line with modem control
- 2.7-meter (9-foot) video cable
- 1.8-meter (6-foot) power cord (wall socket to system box) 120-V systems only
- 0.9-meter (3-foot) convenience power cord (monitor to system box)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- Software licenses: VMS and Network Application Support (NAS 250) for VAXstations: ACA, DECwindows Motif, DECnet-VAX (end node), extensions to DECnet-VAX, VMS/ULTRIX Connection (TCP/IP, RPC, NFS, Telnet), VAXcluster
- English-language user documentation

Order Number 120 V/240 V/S.H.	Memory	Monitor (C = Color; M = Monochrome)	Hz	Graphics
PV31A-AD/AE/AF	8 MB	17-inch M VRM17, 1024 × 768	72	8-plane 2D grayscale
PV31A-CA/CB/CC	8 MB	19-inch M VR319, 1280 × 1024	72	8-plane 2D grayscale
PV31A-BA/BB	8 MB	13-inch C VRT13, 1024 × 768	60	8-plane 2D color
PV31A-AA/AB/AC	8 MB	16-inch C VRC16, 1024 × 768	72	8-plane 2D color
PV31A-CD/CE/CF	8 MB	16-inch C VRT16, 1280 × 1024	72	8-plane 2D color
PV31A-CH/CJ/CK	8 MB	19-inch C VRT19, 1280 × 1024	72	8-plane 2D color

Step 2—Country Kits, Power Cords, Keyboards (Not required for 120-V systems)

Select country kit, or power cord and keyboard for all 240-V systems.

- Country kits include power cord and keyboard.
- Power cords connect system to wall socket.

Country Kit	OR	Power Cord	and	Keyboard	Country	Language
FCP01-AG		**BN19W-2E**		**LK401-AG**	Austria	German/Austrian
FCP01-AB		**BN19K-2E**		**LK401-AB**	Belgium	Flemish
FCP01-AD		**BN19K-2E**		**LK401-AD**	Denmark	Danish
FCP01-AF		**BN19W-2E**		**LK401-AF**	Finland	Suomi
FCP01-AP		**BN19W-2E**		**LK401-AP**	France	French
FCP01-AG		**BN19W-2E**		**LK401-AG**	German	German
FCP01-AH		**BN19W-2E**		**LK401-AH**	Holland	Dutch
FCP01-AT		**BN18L-2E**		**LK401-AT**	Israel	Hebrew
FCP01-AI		**BN19Z-2E**		**LK401-AI**	Italy	Italian
FCP01-AN		**BN19W-2E**		**LK401-AN**	Norway	Norwegian
FCP01-AV		**BN19W-2E**		**LK401-AV**	Portugal	Portuguese
FCP01-AS		**BN19W-2E**		**LK401-AS**	Spain	Spanish
FCP01-AM		**BN19W-2E**		**LK401-AM**	Sweden	Swedish
FCP01-AK		**BN19E-2E**		**LK401-AK**	Switzerland	French
FCP01-AL		**BN19E-2E**		**LK401-AL**	Switzerland	German
FCP01-AE		**BN19A-2E**		**LK401-AA**	U.K./Ireland	English
		BN19H-2E		**LK401-AA**	Australia/NZ	English
		BN19P-1K		**LK401-AA**	U.S./Canada	English
		BN19P-1K		**LK401-AC**	Canada	French
		BN19S-2E		**LK401-AA**	India	English
		BN19P-1K		**LK401-CA**	China	Chinese
				LK401-AJ	Japan	Katakana
				LK402-AA	WPS keyboard	English
				LK402-AQ	WPS keyboard	French
				LK402-AS	WPS keyboard	Spanish

Step 3—Storage

Select storage devices if required.

- An RZ2x disk must be ordered as a system disk if the system is not being booted over the network by a server.
- Maximum of seven SCSI storage devices—not to exceed one internal hard drive and three external expansion boxes.

Step 3a—Internal Storage (Factory/Field Installed)

VLC systems have one internal storage cavity. Factory-installed variant (RZ23L-EJ, RZ24L-EJ) includes Factory-Installed Software (FIS)* which includes VMS and DECwindows Motif.

RZ23L-EJ/EH	121-Mbyte internal disk drive
RZ24L-EJ/EH	245-Mbyte internal disk drive

* FIS is not a substitute for a software load device (media) and documentation; see Step 13.

Step 3b—External Storage

- Small tabletop expansion boxes (120 V and 240 V) include 18-inch SCSI cable.
- 120-V expansion boxes include a power cord; order country-specific power cord for 240-V variants from Step 2.

Single-Drive Expansion Boxes

120 V/240 V

SZ03A-AA/AB	RX26 2.8-Mbyte 3.5-inch diskette drive
SZ03B-AA/AB	RZ23L 121-Mbyte 3.5-inch disk drive
SZ03B-BC/BD	RZ24L 245-Mbyte 3.5-inch disk drive
SZ03B-CA/CB	RZ25 426-Mbyte 3.5-inch disk drive
RRD42-FA/DG	RRD42 600-Mbyte compact disc drive
TLZ06-FA	4.0-Gbyte 4-mm digital audio tape (DAT) drive

Expansion Boxes

For SZ12 and SZ16 expansion box information, see Chapter 7, *Storage Devices.*

Step 3c—Wall-Mount Bracket

BA10X-AA	Wall-mount bracket for VLC system box

Step 4—Memory

- System includes 8 Mbytes of memory; additional memory may be added in 8-Mbyte increments.
- Six SIMM memory slots total

MS40-BA	8 Mbytes (2- × 4-Mbyte 80-ns SIMMs), maximum 24 Mbytes

Step 5—Video Cables

Custom systems include a 9-foot video cable; if additional video cable is required, order below.

BC29G-09	Video cable (9-foot) for color/grayscale monitors

Step 6—Networking Cables

Base system module includes thick wire Ethernet connector. Two adapters are available, ThinWire or 10BaseT (Twisted Pair).

DESTA-BA	ThinWire Ethernet Station Adapter
H3350-AA	10BaseT (Twisted Pair) Ethernet Adapter

Select desired length of thick wire to connect ThinWire or 10BaseT adapter to base system. Do not attach adapter directly to base system module.

BNE4C-xx	Thick wire 802.3/Ethernet cable (xx = 02/05 refers to length in meters).
BNE3H-xx	Thick wire transceiver cable with straight connector—PVC (xx = 05/10/20/40 refers to length in meters).
BNE3L-xx	Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40 refers to length in meters).
BC16M-xx	ThinWire Ethernet cable (xx = 06/15/30 refers to length in feet).
H8225-00	ThinWire terminator
BN24F-03	Twisted Pair cable

See Chapter 6, *Networks, Communications, and Cables*, for more information and more choices.

Step 7—Optional Input/Output Devices (Customer Installable)

VSXXX-AB	11-inch × 11-inch tablet
VSXXX-GA	Three-button ergonomic rectangular mouse (included with system)
VSXXX-JA	Audio headset for VAXstation 4000 VLC and Models 60 and 90 workstations

Step 8—Printers

Refer to Chapter 8, *Terminals and Printers*, for ordering information.

Step 9—Hardware Documentation

VAXstation 4000 VLC information kits are shipped with every system. The information kit includes Internal Options Quick Card, Peripheral Devices Quick Card, and Internal Replacement Quick Card; the following documents may be ordered, if required.

EK-VAXVL-OG	VAXstation 4000 VLC Owner's Guide
EK-SDDBY-OG	SZ03 Expansion Box Owner's Guide
EK-INTRE-QC	Quick connect card
EK-INTNA-QC	Adding memory quick card
EK-PERDE-QC	Adding a drive quick card
EK-VMSFI-RC	VAXstation Factory-Installed Software Guide

Step 10—Graphic Option Upgrades (Field Installable)

Custom systems include 8-plane color/grayscale graphics board. Graphics options are listed with compatible monitors. Options require Digital Services installation.

Order Number	Description	Compatible Monitor	Hz
PV31G-AC	8-plane color/grayscale graphics board for use with monitors operating at: 1280 × 1024 resolution, 72 Hz	16-inch C **VRT16-HA/H4** 19-inch C **VRT19-HA/H4** 19-inch C **VR320-DA/D4** 19-inch M **VR319-DA/D4**	66/72 66/72 72 72
PV31G-AD	8-plane color graphics board for use with monitors operating at: 1280 × 1024 resolution, 66 Hz	16-inch C **VRT16-DA/D4** 19-inch C **VRT19-DA/D3/D4** 19-inch C **VR320-CA/C4** 16-inch C **VRT16-HA/H4** 19-inch C **VRT19-HA/H4**	66 66 66 66/72 66/72

Step 11—Software Media and Documentation

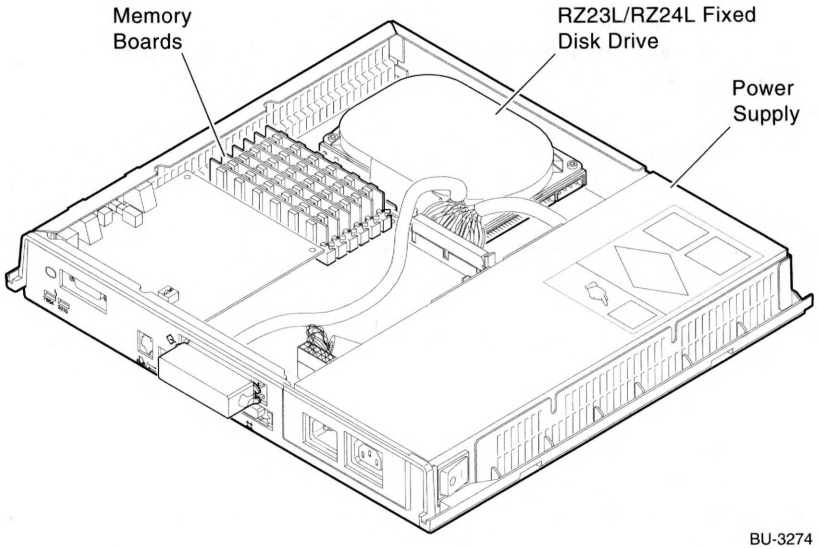
VLC requires VMS V5.5 or higher. A media and documentation kit is recommended for the first system on site. Systems include the following license PAKs: VMS operating system and NAS 250 for VAXstations (ACA, DECwindows, Motif, DECnet-VAX (end-node), extensions to DECnet-VAX, VMS/ULTRIX Connection, VAXcluster).

QA-09SAA-S5	VMS and DECwindows media (TK50) and documentation
QA-09SAA-S8	VMS and DECwindows media (CD-ROM) and documentation
QA-09SAA-SM	VMS and DECwindows media (magtape) and documentation
QA-XVDAA-H5	NAS 250 for VAXstations media (TK50) and documentation (CD-ROM)
QA-XVDAA-HM	NAS 250 for VAXstations media (magtape) and documentation (CD-ROM)
QA-XVDAA-H8	NAS 250 for VAXstations media and documentation on CD-ROM

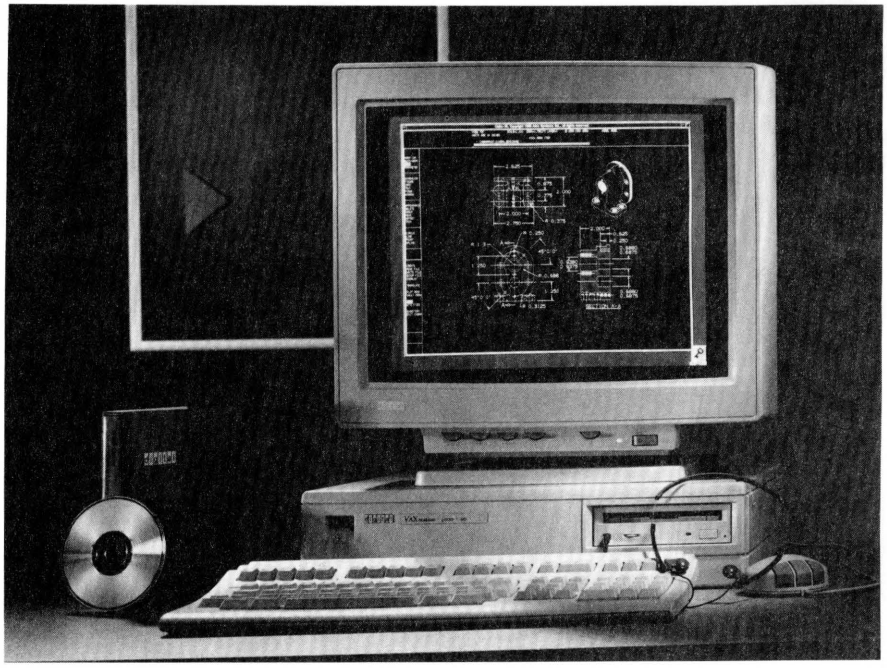
DEC SoftPC, an optional layered product, allows a VAXstation 4000 VLC to run MS-DOS programs on the workstation with no added hardware. Order license, media, and documentation below.

QL-YNWAA-3B	DEC SoftPC for VMS single-user license
QA-YNWAA-H5	DEC SoftPC for VMS media (TK50)
QA-YNWAA-HM	DEC SoftPC for VMS media (magtape)
QA-YNWAA-GZ	DEC SoftPC for VMS documentation

VAXstation 4000 VLC System Diagram



VAXstation 4000 Model 60



Product Description

VAXstation 4000 Model 60 has twice the price/performance of the VAXstation 3100 Model 76 and offers a 60 percent increase in SPECmark performance. The improved performance is achieved by using the CMOS three-chipset which operates at 18 nanoseconds, providing a system CPU rated at approximately 12.0 SPECmarks.

The Model 60 introduces support for 3D graphics. In addition to the accelerated 2D offered on standard systems, 3D capability is now available in 8-plane or 24-plane configurations. Both options (8-plane SPXg with 16-bit Z-Buffering, and 24-plane SPXgt with 24-bit Z-Buffering) provide support for full double buffering. A choice of 4-plane grayscale or 8-plane color graphics operate on a variety of monitors: two monochrome: 17- and 19-inch, for 4-plane grayscale, and three color: 16-inch and 19-inch Trinitron, and 19-inch conventional, for 8-plane color systems. Audio input and output capability are included. Dual- and quad-screen color graphics systems can be ordered as custom systems or as optional upgrades.

System memory, internal storage, and graphic option upgrades are customer installable. The system box supports up to 104 Mbytes of memory. Internal storage permits a maximum of two 3.5-inch hard disks and one removable media device—diskette, compact disc, or tape drive. Model 60 has a synchronous SCSI controller on the CPU board which increases SCSI throughput by up to a factor of 3 times that of the asynchronous SCSI controller used on VAXstation 3100 systems. Three external expansion boxes can be connected to the Model 60. The following options are supported in SZ03, SZ12 or SZ16 expansion boxes: TZ30, TLZ06, and TZK10 tapes; RX26 and RRD42 removable media; and RZ23, RZ23L, RZ24L, RZ25, RZ55, RZ56, RZ57, RZ58 hard disk drives.

For communication and networking needs, the system is equipped with both ThinWire and thick wire Ethernet, one DEC-423 serial line and one EIA-232D serial line with modem control. An additional synchronous communications option is available to allow DECnet Phase V, OSI, and TCP/IP layered products to use synchronous wide area network communication.

Product Description *(Continued)*

VAXstation 4000 Model 60 software licenses include VAX VMS and Network Application Support—NAS 250 for VAXstations. Systems ordered with a disk will have the base operating system, VMS and DECwindows Motif V1.0, factory installed. These workstations can expand distributed networks, run graphics-based applications, or improve user productivity with the multi-window capability of DECwindows in commercial and technical environments. DEC SoftPC runs MS-DOS applications in a workstation.

Upgrade kits are available to upgrade VAXstation 3100 Models 30, 38, 40, 48, and 76 to a VAXstation 4000 Model 60.

Step 1—Systems

- Select system. 120-V systems include a U.S. keyboard and all required power cords. If a 240-V system is selected, the appropriate country kit or keyboard and power cord are required from Step 2.
- Field-installable options ship separately for installation at customer site. Select factory-installed options for custom systems.

VAXstation 4000 Model 60 systems include

- Base module with 8-Mbyte embedded memory
- Memory—six SIMM connectors
- Cache memory: 256 Kbytes
- ThinWire/Thick wire Ethernet controller on base system module
- Synchronous SCSI controller on base system module
- 2D or 3D graphics accelerator
- Monitor
- U.S. keyboard, 120-V only
- Mouse
- One DEC-423 serial line
- One EIA-232D serial line with modem control
- 2.7-meter (9-foot) color/monochrome video cable
- 1.8-meter (6-foot) power cord, 120-V systems only
- 0.9-meter (3-foot) monitor power cord (monitor to system box)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- Software licenses: VMS and Network Applications Support-NAS 250 for VAXstations; ACA, DECwindows Motif, DECnet-VAX (end-node), extensions to DECnet-VAX, VMS/ULTRIX Connection, VAXcluster
- English-language user documentation.

Note: Systems ordered with a factory-installed RZ2x disk include factory-installed software (FIS).

Model 60 Systems

Order Number 120 V/240 V/S.H.	Memory	Monitor C = Color M = Monochrome	Hz	Graphics
PV61A-BE/BF/BH	8 MB	17-inch M VRM17	72	LCG 4-plane/2D grayscale
PV61A-AA/AB/AC	8 MB	19-inch M VR319	72	LCG 4-plane/2D grayscale
PV61A-AD/AE/AF	8 MB	16-inch C VRT16	66	LCG 8-plane/2D color
PV61A-AX/AY/BA	8 MB	19-inch C VR320	66	LCG 8-plane/2D color
PV61A-AH/AJ/AK	8 MB	19-inch C VRT19	66	LCG 8-plane/2D color
PV61A-AL/AM/AN*	8 MB	16-inch C VRT16	66	SPXg 8-plane/3D color
PV61A-AP/AR/AS*	8 MB	19-inch C VRT19	66	SPXg 8-plane/3D color
PV61A-AT/AV/AW*	8 MB	19-inch C VRT19	66	SPXgt 24-plane/3D color

* SPXg and SPXgt systems include DEC PHIGS Runtime license and require DECwindows Motif V1.0 media. Recommended configurations for SPXg and SPXgt standalone systems are 24–32 Mbytes of memory and two RZ25 internal disks.

Dual- and Quad-Monitor systems

PV61A-BB/BC/BD[1]	8 MB	19-inch C VRT19	66	8-plane 2D/dual-monitor/color
PV61E-AC/AD/AE[2]	8 MB	19-inch C VRT19	66/72	8-plane 2D/quad-monitor/color[4]
PV61E-AA/AB[3]	8 MB	No monitor	66/72	8-plane 2D/quad-monitor/color[4]

[1] Includes two video cables and one monitor; see Step 1a.
[2] Includes four video cables and one monitor; see Step 1a.
[3] Includes four video cables, no monitor; see Step 1a.
[4] Quad-monitor systems **do not** support TURBOchannel adapter or synchronous communication options.

Monitors for Dual- and Quad-Monitor Systems

Select additional monitors for dual- and quad-monitor systems; video cables for additional monitors are included with system; order power cord for each monitor from Step 2.

VRT16-HA/H4	16-inch color monitor 1280 × 1024, 66/72 Hz
VRT19-HA/H4	19-inch color monitor 1280 × 1024, 66/72 Hz
VR320-CA/C4	19-inch color monitor 1280 × 1024, 66 Hz
VR320-DA/D4	19-inch color monitor 1280 × 1024, 72 Hz

Step 2—Country Kits, Power Cords, Keyboards (Not Required for 120-V Systems)

Country Kit	or	Power Cord	and	Keyboard	Country	Language
FCP01-AG		BN19W-2E		LK401-AG	Austria	German/Austrian
FCP01-AB		BN19W-2E		LK401-AB	Belgium	Flemish
FCP01-AD		BN19K-2E		LK401-AD	Denmark	Danish
FCP01-AF		BN19W-2E		LK401-AF	Finland	Suomi
FCP01-AP		BN19W-2E		LK401-AP	France	French
FCP01-AG		BN19W-2E		LK401-AG	German	German
FCP01-AH		BN19W-2E		LK401-AH	Holland	Dutch
FCP01-AT		BN18L-2E		LK401-AT	Israel	Hebrew
FCP01-AI		BN19Z-2E		LK401-AI	Italy	Italian
FCP01-AN		BN19W-2E		LK401-AN	Norway	Norwegian
FCP01-AV		BN19W-2E		LK401-AV	Portugal	Portuguese
FCP01-AS		BN19W-2E		LK401-AS	Spain	Spanish
FCP01-AM		BN19W-2E		LK401-AM	Sweden	Swedish
FCP01-AK		BN19E-2E		LK401-AK	Switzerland	French
FCP01-AL		BN19E-2E		LK401-AL	Switzerland	German
FCP01-AE		BN19A-2E		LK401-AA	U.K./Ireland	English
		BN19H-2E		LK401-AA	Australia/NZ	English
		BN19P-1K		LK401-AA	U.S./Canada	English
		BN19P-1K		LK401-AC	Canada	French
		BN19S-2E		LK401-AA	India	English
		BN19P-1K		LK401-CA	China	Chinese
				LK401-AJ	Japan	Katakana
				LK402-AA	WPS keyboard	English
				LK402-AQ	WPS keyboard	French
				LK402-AS	WPS keyboard	Spanish

Step 3—Storage

Select storage devices if required. Factory-installed variants (RZ23L-EM, RZ24L-EM, RZ25-EM) include factory-installed software (FIS) which includes VMS and DECwindows Motif V1.0.

Configuration Rules

- An RZ23L, RZ24L, or RZ25 disk must be ordered as a system disk if the system is not being booted over the network by a server.
- Maximum of seven SCSI devices, not to exceed two internal hard drives, one removable media device, and four external devices; or up to six external SCSI devices (with only one internal drive).

Note: FIS is not a substitute for a software load device; media and documentation is required for first system on side.

Step 3a—Internal Drives (Factory/Field Installed)

Systems have three internal storage cavities.

Slot 1—Removable media (RX26, RRD42, TLZ06, TZK10)
Slot 2—3.5-inch disk RZ23L, RZ24L, or RZ25
Slot 3—3.5-inch disk RZ23L, RZ24L, or RZ25

Select up to one half-height removable media device.

RX26-ES/UL	2.8-Mbyte 3.5-inch internal diskette drive
RRD42-JM/JL	600-Mbyte internal compact disc drive
TLZ06-GF/GG	4.0-Gbyte 4-mm digital audio tape (DAT)
TZK10-GF/GG	525-Mbyte quarter-inch cartridge (QIC) tape

Select up to two 3.5-inch half-height disk drives. Factory-installed variants (-EM) include Factory-Installed Software (FIS).

RZ23L-EM/EL	121-Mbyte internal disk drive
RZ24L-EM/EL	245-Mbyte internal disk drive
RZ25-EM/EL	426-Mbyte internal disk drive

Step 3b—External Storage (Expansion Box)

For SZ03, SZ12 and SZ16 expansion box information see Chapter 7, *Storage Devices.*

Step 3c—Workstands

BA46X-AA	Vertical floor stand. Holds one VAXstation 4000 system box or one SZ16 expansion box.
H9855-AA	Horizontal workstand. Holds one VAXstation 4000 system box and three SZ16 expansion boxes.

Step 4—Memory

Systems include 8-Mbyte memory embedded on base system module. Additional memory may be added in 8-Mbyte or 32-Mbyte increments. Six SIMM memory slots total; 8-Mbyte and 32-Mbyte modules may be combined.

MS44L-BA	8 Mbytes parity (2 × 4-Mbyte, 100 ns SIMMs)
MS44-DA	32 Mbytes parity (2 × 16-Mbyte, 100 ns SIMMs)

Step 5—TURBOchannel Adapter (Customer Installable)

- TURBOchannel adapter provides one single-width bus slot for Digital or third-party options.
- Adapter requires VMS V5.5-2 or higher
- Required for TURBOchannel communication options (Step 5a)

DWCTX-BX	TURBOchannel Adapter Module

Note: Quad-monitor systems **do not** support TURBOchannel adapter or synchronous communication options.

Step 5a—TURBOchannel Options (Customer Installable)

- Requires a TURBOchannel adapter.
- Each option requires one TURBOchannel slot.
- The following TURBOchannel options have VMS/driver support.

PMAD-AB	Thick wire Ethernet TURBOchannel option card
PMAZ-AB	Additional SCSI TURBOchannel option card
DEFZA-AA	DEC FDDIcontroller 700 (fiber optic)

Step 6—Synchronous Communication Options

Select synchronous communication option if TURBOchannel adapter was not selected from Step 5.

Note: Quad-monitor systems **do not** support TURBOchannel adapter or synchronous communication options

VAX Wide Area Network (WAN) device driver license is required before adding a synchronous communication controller. Order license, media (TK50 or magtape), and documentation.

QL-VAWA9-AA	VAX WAN V1.2 device driver license
QA-VAWAA-H5	VAX WAN V1.2 device driver media (TK50) and documentation
QA-VAWAA-HM	VAX WAN V1.2 device driver media (magtape) and documentation
QA-VAWAA-GZ	VAX WAN V1.2 device driver documentation

Step 6a—Synchronous Communication Controller (Customer Installable)

DSW21-AA	One-line synchronous communication controller and EIA-232 V.24 synchronous modem cable
DSW21-AB	One-line synchronous communication controller and EIA-423 V.10 synchronous modem cable
DSW21-AC	One-line synchronous communication controller and EIA-422 V.36 synchronous modem cable
DSW21-AD	One-line synchronous communication controller and V.35 synchronous modem cable
DSW21-AE	One-line synchronous communication controller and EIA-530 synchronous modem cable
DSW21-AF	One-line synchronous communication controller and X.21 synchronous modem cable

Step 7—Video and Keyboard/Mouse Extender Cables

Custom systems include a 9-foot (2.7-meter) color/monochrome video cable; if additional video cable is required, order below.

BC29G-09	Video cable (9-foot) for color/monochrome monitors
BC13M-10	10-foot keyboard/mouse extender cable and 10-foot 120-V power cord

Step 8—Networking Cables

BC16M-xx ThinWire Ethernet cable (xx = 06/15/30 feet in length)
BNE4C-xx Thick wire transceiver cable with straight connector (PVC) (xx = 05/10/20/40 meters in length)
BNE3L-xx Thick wire transceiver cable with straight connector (Teflon) (xx = 05/10/20/40 meters in length)

Note: Right-angle Ethernet cables are not supported.

Step 9—Optional Input/Output Devices

The tablet can be used in place of the mouse. The Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. The LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. In addition, each package includes a power supply, cables, and user documentation.

VSXXX-AB 11-inch × 11-inch tablet
VSXXX-GA Three-button ergonomic rectangular mouse (included with system)

VSX10-AA/A3 Combination LPFK and PFD package 120 V/240 V
VSX20-AA/A3 LPFK package 120 V/240 V
VSX30-AA/A3 PFD package 120 V/240 V

Audio headset (input/output capability) for VAXstation 4000 VLC and Models 60 and 90. Uses the MJ audio connector.

VSXXX-JA Audio headset for VAXstation 4000 workstations

Step 10—Printers

Refer to Chapter 8, *Terminals and Printers*, for ordering information.

Step 11—Hardware Documentation

Information kits ship with every system. Information kits include the following documents: *VAXstation 4000 Model 60 Quick Installation Card, Owners and System Installation Guide,* and *Options Installation Guide.* Order additional copies if required.

EK-PMARI-OM Model 60 Owner's and System Installation Guide
EK-PMARI-IG Model 60 Options Installation Guide
EK-VMSFI-RC VAXstation Factory-Installed Software Guide

Step 12—Graphics Option Upgrades

- Graphics options are listed with compatible monitors.
- Upgrades include video cables
- Dual- and quad-monitor options include video cables; require additional monitors and power cords.

Model 60 Graphics

Order Number	Description	Compatible Monitor	Hz
PV21X-GL	8-plane 2D color graphics 1280 × 1024 resolution, 72 Hz	16-inch C **VRT16-HA/H4** 19-inch C **VRT19-HA/H4** 19-inch C **VR320-DA/D4**	66/72 66/72 72
PV61G-BA[1]	8-plane 3D color graphics SPXg 16-bit Z-Buffer 1280 × 1024 resolution, 66 Hz	16-inch C **VRT16-DA/D4** 19-inch C **VRT19-DA/D3/D4** 19-inch C **VR320-CA/C4** 16-inch C **VRT16-HA/H4** 19-inch C **VRT19-HA/H4**	66 66 66 66/72 66/72
PV61G-AA[1]	24-plane 3D color graphics SPXgt 24-bit Z-Buffer 1280 × 1024 resolution, 66 Hz		
PV21X-GA	Dual-monitor color graphics 1280 × 1024 resolution, 66 Hz Two video cables Supports two color monitors		
PV21E-GA	Quad-monitor color graphics board 1280 × 1024 resolution, 60 Hz, 66 Hz, or 72 Hz Four video cables Supports four color monitors	Same as above, plus 19-inch C **VR320-DA/D4**	72

[1] SPXg and SPXgt systems include DEC PHIGS Runtime license and require DECwindows Motif V1.0 media.
[2] -HA/H4 monitors self-select 66 Hz or 72 Hz depending on setting of graphics card in system box.

Step 13—Software Media and Documentation

Requires VMS V5.5 or higher; A media and documentation kit is recommended for the first system on site.

VAXstation 4000 Model 60 includes the following license PAKs: VMS operating system and NAS 250 for VAXstations (ACA, DECwindows Motif, DECnet-VAX (end-node), extensions to DECnet-VAX, VMS/ULTRIX connection, VAXcluster).

QA-09SAA-S5	VMS and DECwindows media (TK50) and documentation
QA-09SAA-S8	VMS and DECwindows media (CD-ROM) and documentation
QA-09SAA-SM	VMS and DECwindows media (magtape) and documentation

NAS 250 software

QA-XVDAA-H5	NAS 250 for VAXstations media (TK50) and documentation (CD-ROM)
QA-XVDAA-HM	NAS 250 for VAXstations media (magtape) and documentation (CD-ROM)
QA-VVDAA-H8	NAS 250 for VAXstations media and documentation on CD-ROM

DEC PHIGS Runtime license is included with SPXg and SPXgt systems. Order media and documentation separately

QA-VK1AA-H5	DEC PHIGS Runtime for VMS media (TK50) and documentation
QA-VK1AA-HM	DEC PHIGS Runtime for VMS media (magtape) and documentation

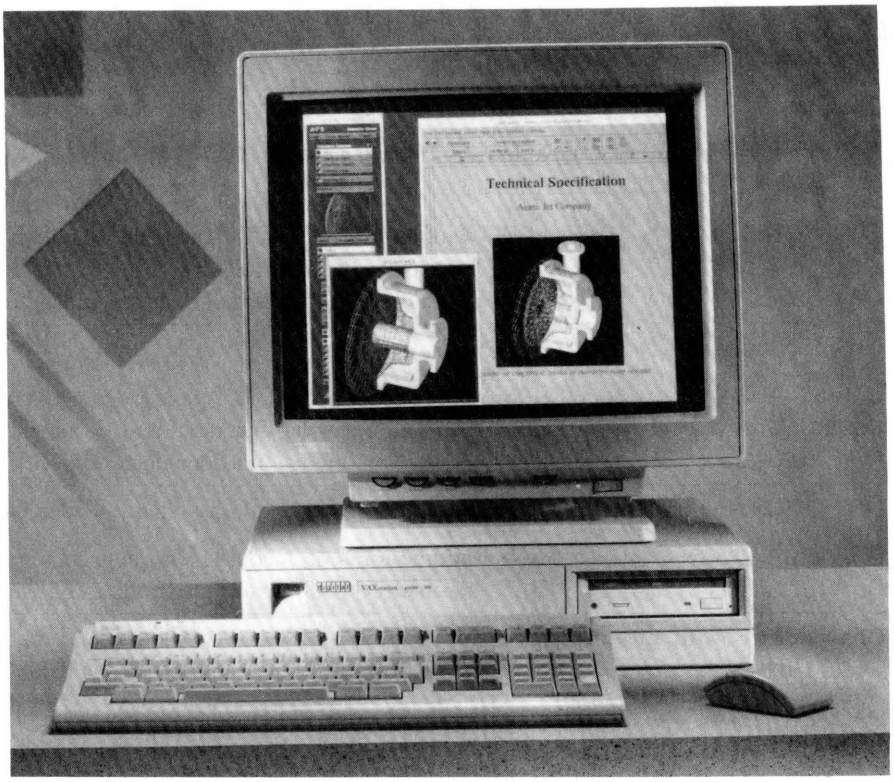
DECwindows Motif V1.0 media is included in NAS 250 for VAXstations and on disks with factory-installed software (FIS). Order media separately for systems with SPXg and SPXgt graphics options if FIS or NAS 250 media is not ordered.

QA-XA1AA-H5	DECwindows Motif V1.0 for VMS media (TK50)
QA-XA1AA-HM	DECwindows Motif V1.0 for VMS media (magtape)
QA-XA1AA-GZ	DECwindows Motif V1.0 for VMS documentation

DEC SoftPC, an optional layered product, allows a VAXstation 4000 to run MS-DOS programs with no added hardware. Order license, media, and documentation.

QL-YNWAA-3B	DEC SoftPC for VMS single-user license
QA-YNWAA-H5	DEC SoftPC for VMS media (TK50)
QA-YNWAA-HM	DEC SoftPC for VMS media (magtape)
QA-YNWAA-GZ	DEC SoftPC for VMS documentation

VAXstation 4000 Model 90



Product Description

The VAXstation 4000 Model 90 is a high-performance, 32.7-SPECmark, OpenVMS workstation using the same 14-nanosecond CMOS NVAX chip set as the VAX 6000 Model 600 datacenter systems. Model 90 offers almost three times the performance of the next fastest VAXstation, the Model 60.

The Model 90 supports three graphic options: LCSPX (accelerated 2D), SPXg (8-plane 3D with 16-bit Z-Buffer) and SPXgt (24-plane 3D with 24-bit Z-Buffer). SPXg graphics provide hardware acceleration for 2D and 3D vectors and solid fill, and SPXgt is most useful in accelerating the performance of applications that make extensive use of smooth-shaded graphics and true-color imaging. All graphics options are supported on 72-Hz monitors.

Main memory can be configured at 16, 32, 64, 80 or 128 Mbytes, and system includes 256 Kbytes of writeback cache. A TURBOchannel adapter option provides direct connectivity to Digital supported TURBOchannel options, including ThickWire Ethernet, additional SCSI, and FDDI controllers.

The Model 90 system enclosure is the same as the Model 60; memory modules, internal storage devices, and graphics option upgrades are customer installable. Internal storage permits a maximum of two 3.5-inch hard disks and one removable media device—diskette, compact disk, or tape drive. External expansion is supported in SZ03, SZ12 and SZ16 expansion boxes.

VAXstation 4000 Model 90 software licenses include VMS operating system and Network Application Support—NAS 250 for VAXstations. Systems ordered with a disk will have the base operating system, VMS V5.5-2 and DECwindows Motif factory installed.

The VAXstation 4000 Model 90 is ideal for applications such as CAD/CAM/CAE, medical and other forms of imaging, econometrics, process control/CIM, mapping, geophysical analysis, scientific visualization, and is suitable as a trader workstation. It provides a level of VAXstation performance that enables users to run the most computationally demanding applications.

To allow VAXstation 4000 Model 60 users to take full advantage of the processing performance of the new Model 90, system upgrade kits are available. The basic upgrade kit consists of a new CPU board with eight memory slots. To provide investment protection, SPXg and SPXgt color graphics cards and monitors can be transferred from a Model 60 systems to an upgraded Model 90 system.

Step 1—Systems

Select system. 120-V Packaged and Custom Systems include a U.S. keyboard and all required power cords. If a 240-V system is selected, the appropriate country kit or keyboard and power cord are required from Step 2.

- Packaged Systems require Step 2 (only if 240-V system is selected). No additions or substitutions can be made to a Packaged System. Field-installable options ship separately for installation at customer site.
- Custom Systems require Step 2 (only if 240-V system is selected) and monitor from Step 3. Select factory-installed options for Custom Systems.

VAXstation 4000 Model 90 systems include

- Base module
- Memory—eight SIMM connectors
- Cache memory: 256 Kbytes
- ThinWire/Thick wire Ethernet controller on base system module
- Synchronous SCSI controller on base system module
- 2D or 3D graphics accelerator
- Monitor (Packaged Systems only)
- U.S. keyboard, 120-V only
- Mouse
- One DEC-423 serial line
- One EIA-232D serial line with modem control
- 2.7-meter (9-foot) color/monochrome video cable
- 1.8-meter (6-foot) power cord, 120-V systems only
- 0.9-meter (3-foot) monitor power cord (monitor to system box)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- Software licenses: VMS and Network Applications Support-NAS 250 for VAXstations; ACA, DECwindows Motif, DECnet-VAX (end-node), extensions to DECnet-VAX, VMS/ULTRIX Connection, VAXcluster
- English-language user documentation.

Note: Packaged Systems and Custom Systems ordered with factory-installed RZ24L or RZ25 include Factory-Installed Software (FIS). Each system also includes VMS software media on TK50 and CD-ROM.

Model 90—Packaged Systems

Order Number 120 V/240 V/S.H.	Memory	Monitor C = Color M = Monochrome	Hz	Graphics	RZ25 = 426 MB
PV710-AL/AM/AN	16 MB	19-inch M VR319	72	LCSPX 8-plane 2D grayscale	1 × RZ25
PV710-AS/AT/AV	16 MB	16-inch C VRT16	72	LCSPX 8-plane 2D color	1 × RZ25
PV710-AP/AQ/AR	16 MB	19-inch C VRT19	72	LCSPX 8-plane 2D color	1 × RZ25
PV710-AA/AB/AC	32 MB	19-inch C VRT19	72	LCSPX 8-plane 2D color	1 × RZ25
PV710-AD/AE/AF*	32 MB	19-inch C VRT19	72	SPXg 8-plane 3D color	1 × RZ25
PV710-AH/AJ/AK*	32 MB	19-inch C VRT19	72	SPXgt 24-plane 3D color	1 × RZ25
PV720-AA/AB/AC*	64 MB	19-inch C VRT19	72	SPXg 8-plane 3D color	2 × RZ25
PV720-AD/AE/AF*	64 MB	19-inch C VRT19	72	SPXgt 24-plane 3D color	2 × RZ25
Model 90—Custom Systems (require monitor from Step 3)					
PV71A-AA/AB	16 MB	Requires monitor	72	LCSPX 8-plane 2D grayscale	
PV71A-AC/AD	64 MB	Requires monitor	72	LCSPX 8-plane 2D grayscale	
PV71A-AE/AF*	32 MB	Requires monitor	72	SPXg 8-plane 3D color	
PV71A-AH/AJ*	64 MB	Requires monitor	72	SPXg 8-plane 3D color	
PV71A-AK/AL*	32 MB	Requires monitor	72	SPXgt 24-plane 3D color	
PV71A-AM/AN*	64 MB	Requires monitor	72	SPXgt 24-plane 3D color	

* SPXg and SPXgt systems include DEC PHIGS Runtime license and require DECwindows Motif V1.1.

Step 2—Country Kits, Power Cords, Keyboards (Not Required for 120-V Systems)

Country Kit	or	Power Cord	and	Keyboard	Country	Language
FCP01-AG		BN19W-2E		LK401-AG	Austria	German/Austrian
FCP01-AB		BN19W-2E		LK401-AB	Belgium	Flemish
FCP01-AD		BN19K-2E		LK401-AD	Denmark	Danish
FCP01-AF		BN19W-2E		LK401-AF	Finland	Suomi
FCP01-AP		BN19W-2E		LK401-AP	France	French
FCP01-AG		BN19W-2E		LK401-AG	German	German
FCP01-AH		BN19W-2E		LK401-AH	Holland	Dutch
FCP01-AT		BN18L-2E		LK401-AT	Israel	Hebrew
FCP01-AI		BN19Z-2E		LK401-AI	Italy	Italian
FCP01-AN		BN19W-2E		LK401-AN	Norway	Norwegian
FCP01-AV		BN19W-2E		LK401-AV	Portugal	Portuguese
FCP01-AS		BN19W-2E		LK401-AS	Spain	Spanish
FCP01-AM		BN19W-2E		LK401-AM	Sweden	Swedish
FCP01-AK		BN19E-2E		LK401-AK	Switzerland	French
FCP01-AL		BN19E-2E		LK401-AL	Switzerland	German
FCP01-AE		BN19A-2E		LK401-AA	U.K./Ireland	English
		BN19H-2E		LK401-AA	Australia/NZ	English
		BN19P-1K		LK401-AA	U.S./Canada	English
		BN19P-1K		LK401-AC	Canada	French
		BN19S-2E		LK401-AA	India	English
		BN19P-1K		LK401-CA	China	Chinese
				LK401-AJ	Japan	Katakana
				LK402-AA	WPS keyboard	English
				LK402-AQ	WPS keyboard	French
				LK402-AS	WPS keyboard	Spanish

Step 3—Monitor (Required for Model 90 Custom Systems)

Model 90 Packaged and Custom Systems support 72-Hz monitors. Select monitor for LCSPX, SPXg or SPXgt graphics. Model 90 does not support dual- and quad-monitor configurations at this time.

VRM17-HA/H4	17-inch monochrome, 1280 × 1024 refresh rate, 72 Hz
VR319-DA/D4	19-inch monochrome, 1280 × 1024 refresh rate, 72 Hz
VRT16-HA/H4	16-inch color, 1280 × 1024 refresh rate, 66/72 Hz
VRT19-HA/H4	19-inch color, 1280 × 1024 refresh rate, 66/72 Hz

Step 4—Storage

Select storage devices if required. Factory-installed variants (RZ24L-EM, RZ25-EM) include factory-Installed Software (FIS) which includes VMS V5.5-2, DECwindows Motif V1.1, and DEC PHIGS.

Configuration Rules

- An RZ24L or RZ25 disk must be ordered as a system disk if the system is not being booted over the network by a server.
- Maximum of seven SCSI devices, not to exceed two internal hard drives, one removable media device, and four external devices; or up to six external SCSI devices (with only one internal drive).

Note: Model 90 systems ship with VMS V5.5-2 software media on TK50 and CD-ROM.

Step 4a—Internal Drives (Factory/Field Installed)

Systems have three internal storage cavities.

Slot 1—Removable media (RX26, RRD42, TLZ06, TZK10)
Slot 2—3.5-inch disk RZ24L or RZ25
Slot 3—3.5-inch disk RZ24L or RZ25

Step 4a—Internal Drives (Factory/Field Installed) *(Continued)*

Select up to one half-height removable media device.

RX26-ES/UL	2.8-Mbyte 3.5-inch internal diskette drive
RRD42-JM/JL	600-Mbyte internal compact disc drive
TLZ06-GF/GG	4.0-Gbyte 4-mm digital audio tape (DAT)
TZK10-GF/GG	525-Mbyte quarter-inch cartridge (QIC) tape

Select up to two 3.5-inch half-height disk drives. Factory-installed variants (-EM) include Factory-Installed Software (FIS).

RZ24L-EM/EL	245-Mbyte internal disk drive
RZ25-EM/EL	426-Mbyte internal disk drive

Step 4b—External Storage (Expansion Box)

For SZ03, SZ12 and SZ16 expansion box information see Chapter 7, *Storage Devices.*

Step 4c—Workstands

BA46X-AA	Vertical floor stand. Holds one VAXstation 4000 system box or one SZ16 expansion box.
H9855-AA	Horizontal workstand. Holds one VAXstation 4000 system box and three SZ16 expansion boxes.

Step 5—Memory

Systems include 16 Mbytes (4 × 4-Mbyte SIMMs) or 32* Mbytes (8 × 4-Mbyte SIMMs) or 64 Mbytes (4 × 16-Mbyte SIMMs). Additional memory may be added in 16- or 64-Mbyte increments if four memory slots are available. Eight SIMM memory slots total; 16- and 64-Mbyte modules may be combined.

MS44L-BC	16 Mbytes (4 × 4-Mbyte, 100 ns SIMMs)
MS44-DC	64 Mbytes (4 × 16-Mbyte, 100 ns SIMMs)

* Increasing memory in 32-Mbyte systems requires removal of 4 × 4-Mbyte SIMMs; trade-in values for SIMMs are offered through *DECdirect* catalog.

Step 6—TURBOchannel Adapter (Customer Installable)

- TURBOchannel adapter provides one single-width bus slot for Digital or third-party options.
- Adapter requires VMS V5.5-2 or higher
- Required for TURBOchannel communication options (Step 6a)

DWCTX-BX	TURBOchannel Adapter Module

Step 6a—TURBOchannel Options (Customer Installable)

- Requires a TURBOchannel adapter.
- Each option requires one TURBOchannel slot.
- The following TURBOchannel options have VMS/driver support.

PMAD-AB	Thick wire Ethernet TURBOchannel option card
PMAZ-AB	Additional SCSI TURBOchannel option card
DEFZA-AA	DEC FDDIcontroller 700 (fiber optic)

Step 7—Synchronous Communication Options

Select synchronous communication option if TURBOchannel adapter was not selected from Step 6a.

VAX Wide Area Network (WAN) device driver license is required before adding a synchronous communication controller. Order license, media (TK50 or magtape), and documentation.

QL-VAWA9-AA	VAX WAN V1.2 device driver license
QA-VAWAA-H5	VAX WAN V1.2 device driver media (TK50) and documentation
QA-VAWAA-HM	VAX WAN V1.2 device driver media (magtape) and documentation
QA-VAWAA-GZ	VAX WAN V1.2 device driver documentation

Step 7a—Synchronous Communication Controller (Customer Installable)

DSW21-AA	One-line synchronous communication controller and EIA-232 V.24 synchronous modem cable
DSW21-AB	One-line synchronous communication controller and EIA-423 V.10 synchronous modem cable
DSW21-AC	One-line synchronous communication controller and EIA-422 V.36 synchronous modem cable
DSW21-AD	One-line synchronous communication controller and V.35 synchronous modem cable
DSW21-AE	One-line synchronous communication controller and EIA-530 synchronous modem cable
DSW21-AF	One-line synchronous communication controller and X.21 synchronous modem cable

Step 8—Video and Keyboard/Mouse Extender Cables

Custom Systems include a 9-foot (2.7-meter) color/monochrome video cable; if additional video cable is required, order below.

BC29G-09	Video cable (9-foot) for color/monochrome monitors
BC13M-10	10-foot keyboard/mouse extender cable and 10-foot 120-V power cord

Step 9—Networking Cables

BC16M-xx	ThinWire Ethernet cable (xx = 06/15/30 feet in length)
BNE4C-xx	Thick wire transceiver cable with straight connector (PVC) (xx = 05/10/20/40 meters in length)
BNE3L-xx	Thick wire transceiver cable with straight connector (Teflon) (xx = 05/10/20/40 meters in length)

Note: Right-angle Ethernet cables are not supported.

Step 10—Optional Input/Output Devices

The tablet can be used in place of the mouse. The Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. The LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. In addition, each package includes a power supply, cables, and user documentation.

VSXXX-AB	11-inch × 11-inch tablet
VSXXX-GA	Three-button ergonomic rectangular mouse (included with system)
VSX10-AA/A3	Combination LPFK and PFD package 120 V/240 V
VSX20-AA/A3	LPFK package 120 V/240 V
VSX30-AA/A3	PFD package 120 V/240 V

Audio headset (input/output capability) for VAXstation 4000 VLC and Models 60 and 90. Uses the MJ audio connector.

VSXXX-JA	Audio headset for VAXstation 4000 workstations

Step 11—Printers

Refer to Chapter 8, *Terminals and Printers*, for ordering information.

Step 12—Hardware Documentation

Information kits ship with every system. Information kits include the following documents: *VAXstation 4000 Model 60 or 90 Quick Installation Card, Owners and System Installation Guide,* and *Options Installation Guide.* Order additional copies if required.

EK-VAXOG-DK	Model 90 Owner's and System Installation Guide
EK-VMSFI-RC	VAXstation Factory-Installed Software Guide

Step 13—Graphics Option Upgrades

- Graphics options are listed with compatible monitors.
- Upgrades include video cables

Note: Model 90 does not support dual- or quad-monitor configurations at this time.

Model 90 Graphics

Order Number	Description	Compatible Monitor	Hz
PV71G-AA	LCSPX 8-plane 2D graphics 1280 × 1024 resolution, 72 Hz	17-inch M **VRM17-HA/H4** 19-inch M **VR319-DA/D4** 16-inch C **VRT16-HA/H4** 19-inch C **VRT19-HA/H4**	72 72 66/72 66/72
PV71G-BA[1]	SPXg 8-plane 3D graphics with 16-bit Z-Buffer 1280 × 1024 resolution, 72 Hz		
PV71G-CA[1]	SPXgt 24-plane 3D graphics with 24-bit Z-Buffer 1280 × 1024 resolution, 72 Hz		

[1] SPXg and SPXgt systems include DEC PHIGS Runtime license and require DECwindows Motif V1.1.
[2] -HA/H4 monitors self-select 66 Hz or 72 Hz depending on setting of graphics card in system box.

Step 14—Software Media and Documentation

Model 90 requires VMS V5.5-2 or higher; VMS software media ships with each system on both TK50 and CD-ROM.

VAXstation 4000 Model 90 includes the following license PAKs: VMS operating system and NAS-250 for VAXstations (ACA, DECwindows Motif, DECnet-VAX (end-node), extensions to DECnet-VAX, VMS/ULTRIX connection, VAXcluster).

NAS 250 software

QA-XVDAA-H5	NAS 250 for VAXstations media (TK50) and documentation (CD-ROM)
QA-XVDAA-HM	NAS 250 for VAXstations media (magtape) and documentation (CD-ROM)
QA-VVDAA-H8	NAS 250 for VAXstations media and documentation on CD-ROM

DEC SoftPC, an optional layered product, allows a VAXstation 4000 to run MS-DOS programs with no added hardware. Order license, media, and documentation.

QL-YNWAA-3B	DEC SoftPC for VMS single-user license
QA-YNWAA-H5	DEC SoftPC for VMS media (TK50)
QA-YNWAA-HM	DEC SoftPC for VMS media (magtape)
QA-YNWAA-GZ	DEC SoftPC for VMS documentation

VAXstation 4000 System Upgrades

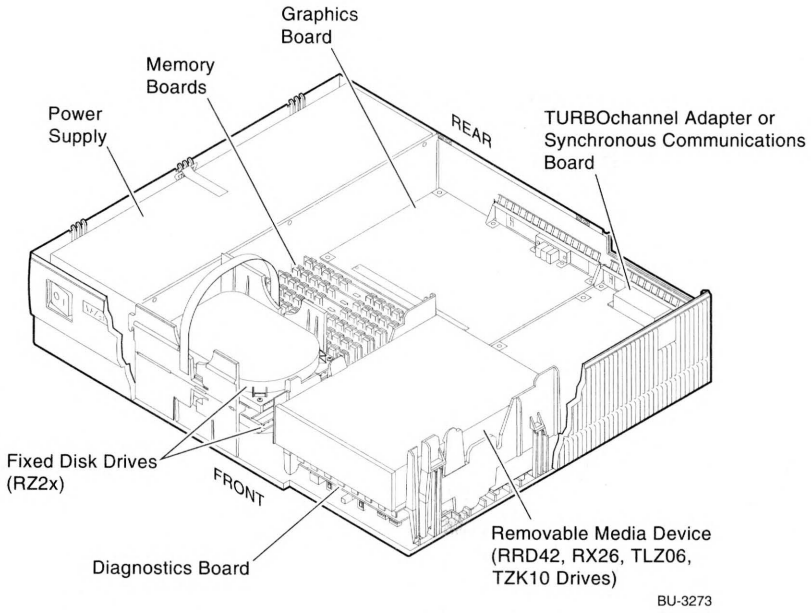
Upgrade kits must be installed by Digital Services.

	From	To	Notes
PV31U-A9	VAXstation 3100 series with VR160, VR150, VR297, VR299, VR262, 60 Hz	VAXstation 4000 VLC 1024 × 864 (60 Hz)	1
PV31U-D9	VAXstation 3100 series with VRT16, VRT19, VR329, VR319, 66 Hz	VAXstation 4000 VLC 1280 × 1024 (66 Hz)	1
PV31U-C9	VAXstation 3100 series with VRM17, VR319, VRT16, VR320, VRT19, 72 Hz	VAXstation 4000 VLC 1280 × 1024 (72 Hz)	1
PV61U-B9	VAXstation 3100 series with VR297, VR299 monitors	VAXstation 4000 Model 60 2D LCG graphics	2
PV61U-A9	VAXstation 3100 series with VRT16, VRT19, VR320 monitors	VAXstation 4000 Model 60 2D LCG graphics	2
PV71U-AF	VAXstation 4000 Model 60 Base board 2D LCG graphics	VAXstation 4000 Model 90 LCSPX 2D graphics	3, 5
PV71U-AH	VAXstation 4000 Model 60 3D SPXg graphics	VAXstation 4000 Model 90 3D SPXg graphics	4, 5
PV71U-AJ	VAXstation 4000 Model 60 3D SPXgt graphics	VAXstation 4000 Model 90 3D SPXgt graphics	4, 5

Notes

1. Upgrade kits include: VAXstation 4000 VLC enclosure and power supply, 8 Mbytes of memory, 8-plane color/grayscale graphics board, 2D graphics accelerator, 2.7-meter (9-foot) color/monochrome video cable, bracket for one internal RZ23L or RZ24L disk, thick wire Ethernet, one DEC-423 serial line, one EIA-232D serial line with modem control, synchronous SCSI controller, software licenses and English language user documentation. Upgrade supports VAXstation 3100 options, LK201 keyboard, mouse, and three expansion boxes.
2. Upgrade kits include: VAXstation 4000 Model 60 CPU, BA46 system enclosure, power supply, 8 Mbytes of memory, 2D LCG 8-plane color graphics board, 2.7-meter (9-foot) color/monochrome video cable, brackets for three internal devices (one removable media, two fixed disks), ThinWire/thick wire Ethernet, one DEC-423 serial line, one EIA-232D serial line with modem control, synchronous SCSI controller, software licenses and English language user documentation. Upgrade supports VAXstation 3100 options, LK201 keyboard, VSxxx-AA mouse, and three expansion boxes. Upgrades require the mandatory return of VAXstation 3100 CPU board and system enclosure.
3. Upgrade kits include: VAXstation 4000 Model 90 CPU, 2D LCSPX 8-plane color graphics board, software license, VMS software kit, user documentation and Model 90 medallion. Upgrades require the mandatory return of Model 60 CPU board and LCG graphics.
4. Upgrade kits include: VAXstation 4000 Model 90 CPU, software license, VMS software kit, Model 90 user documentation and medallion. SPXg or SPXgt graphics cards and monitors will be transferred to Model 90 system.
5. Model 90 systems require a minimum of 16 Mbytes of main memory; 8-Mbyte memory embedded on Model 60 system board cannot be transferred. See Step 4 for Model 90 memory configurations. Trade-in values for memory modules are offered through *DECdirect* catalog. 4-Mbyte and 16-Mbyte SIMMs from Model 60 may be transferred to Model 90 in sets of four **only**, (e.g. two MS44L-BA = 4 × 4-Mbyte SIMMs). Model 90 memory modules must be installed in sets of four matching value SIMMs.

VAXstation 4000 Models 60 and 90 System Diagram



VAXstation 4000 VLC and Models 60 and 90 Specifications

Power Requirements

	VLC	Model 60/90
SPECmarks	6.2	12.0/32.7
Line voltage	120 V/240 V	Same
Voltage tolerance—RMS	88–132 V/194–264 V	Same
Frequency/single phase	60 Hz/50 Hz	Same
Frequency tolerance	47–63 Hz	Same
Maximum running current	1.6 A/0.82 A	6.2 A/3.1 A
Maximum power consumption	108 W	465 W
Operating Environment		
Temperature	15°–32°C (59°–90°F)	10°–40°C (50°–104°F)
Relative humidity	20%–80% noncondensing	20%–80% noncondensing
Maximum operating altitude	2.4 km (8,000 feet)	2.4 km (8,000 feet)
Physical Characteristics		
Height	6.1 cm (3.6 in.)	11.3 cm (4.4 in.)
Width	39.1 cm (15.4 in.)	48.2 cm (19.0 in.)
Depth	36.8 cm (14.5 in.)	40.0 cm (15.5 in.)
Weight (diskless)	3.6 kg (8 lb)	4.5 kg (10 lb)

Workstation Color Monitors

Product Northern Hemisphere Southern Hemisphere	**VRT13** **-DA* -D3**** –	**VRC16** **-CA** **-C4**	**VRT16** **-DA** **-D4**	**VRT16** **-HA** **-H4**	**VR320** **-CA** **-C4**	**VR320** **-DA** **-D4**	**VRT19** **-DA* -D3**** **-D4**	**VRT19** **-HA** **-H4**
CRT Screen size Dot pitch Phosphor Surface treatment	 13 V/14-in. Trinitron 0.26 mm P22 Silica	 16 V/17-in. FS 0.26 mm P22 Silica	 16 V/17-in. Trinitron 0.26 mm P22 Silica	 16 V/17-in. Trinitron 0.26 mm P22 Conductive Silica	 19 V/20-in. 0.31 mm P22 AR Panel	 19 V/20-in. 0.31 mm P22 AR Panel	 19 V/20-in. Trinitron 0.31 mm P22 Silica	 19 V/20-in. Trinitron 0.31 mm P22 Conductive AR
Resolution/Refresh Rate (Hz) (All modes are non-interlaced except for ***8514/A which is interlaced.)	– – 1024 × 768 (87)*** – – 1024 × 768 (60) – 800 × 600 (56) – 640 × 480 (70) 640 × 480 (60)	– 1280 × 1024 (66) 1024 × 768 (87)*** 1024 × 768 (72) 1024 × 768 (70) 1024 × 768 (60) 800 × 600 (72) 800 × 600 (56) 640 × 480 (72) 640 × 480 (70) 640 × 480 (60)	– 1280 × 1024 (66) – – – – – – – – – –	1280 × 1024 (72) 1280 × 1024 (66) – – – – – – – – – –	– 1280 × 1024 (66) – – – – – – – – – –	1280 × 1024 (72) – – – – – – – – – – –	– 1280 × 1024 (66) – – – – – – – – – –	1280 × 1024 (72) 1280 × 1024 (66) – – – – – – – – – –
Active display Horizontal (maximum) Vertical (maximum)	 240 mm (9.4 in.) 180 mm (7.0 in.)	 300 mm (11.8 in.) 236 mm (9.3 in.)	 295 mm (11.6 in.) 236 mm (9.3 in.)	 295 mm (11.6 in.) 236 mm (9.3 in.)	 342 mm (13.5 in.) 273 mm (10.7 in.)	 342 mm (13.5 in.) 273 mm (10.7 in.)	 343 mm (13.5 in.) 274 mm (10.7 in.)	 343 mm (13.5 in.) 274 mm (10.7 in.)
Connectors Signal Power	 9 pin D-subminiature IEC receptacle	 BNC (5) IEC receptacle	 BNC (3) IEC receptacle	 BNC (3) IEC receptacle	 BNC (3) IEC receptacle	 BNC (3) IEC receptacle	 BNC (3) IEC receptacle	 BNC (3) IEC receptacle
Signal cable	Included with monitor 9 to 15-pin D-subminiature	Included with system	Included with system	Included with system	Included with system	Included with system	Included with system	Included with system
Power supply AC Auto ranging Consumption	 100–120 V/50–60 Hz* 220–240 V/50 Hz** No 80 W maximum	 90–264 V/50–60 Hz Yes 110 W maximum	 90–264 V/50–60 Hz Yes 200 W maximum	 90–264 V/50–60 Hz Yes 200 W maximum	 90–264 V/50–60 Hz Yes	 90–264 V/50–60 Hz Yes	 90–264 V/50–60 Hz *America/**Europe Yes 220 W maximum	 90–264 V/50–60 Hz Yes 220 W maximum
Dimensions Height Width Depth	 355 mm (14.0 in.) 348 mm (13.7 in.) 411 mm (16.2 in.)	 432 mm (17.0 in.) 411 mm (16.2 in.) 434 mm (17.1 in.)	 409 mm (16.1 in.) 406 mm (16.0 in.) 453 mm (17.8 in.)	 409 mm (16.1 in.) 406 mm (16.0 in.) 453 mm (17.8 in.)	 457 mm (18.1 in.) 495 mm (19.5 in.) 452 mm (17.8 in.)	 457 mm (18.1 in.) 495 mm (19.5 in.) 452 mm (17.8 in.)	 474 mm (18.7 in.) 480 mm (18.9 in.) 505 mm (19.9 in.)	 474 mm (18.7 in.) 480 mm (18.9 in.) 505 mm (19.9 in.)
Weight	13.0 kg (29 lb)	25 kg (55 lb)	25.3 kg (56 lb)	25.3 kg (56 lb)	29 kg (64 lb)	25.3 kg (56 lb)	32.5 kg (71.5 lb)	32.5 kg (71.5 lb)
MPRII low-emission monitor	–	–	–	Yes	–	–	Yes	Yes
FCC/VDE/VCCI Class A Class B	 Yes –	 Yes –	 Yes –	 Yes –	 Yes –	 Yes –	 Yes –	 Yes –
UL/CSA/TUV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHHS/HWC/PTB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

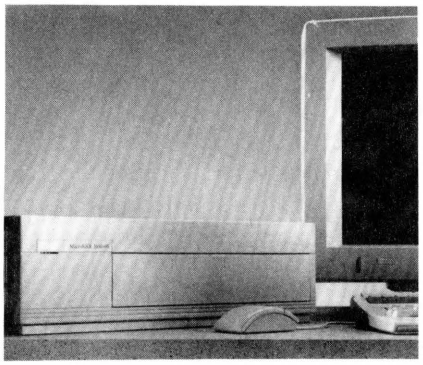
VAXstation 4000 VLC and Models 60 and 90 Monitor Chart

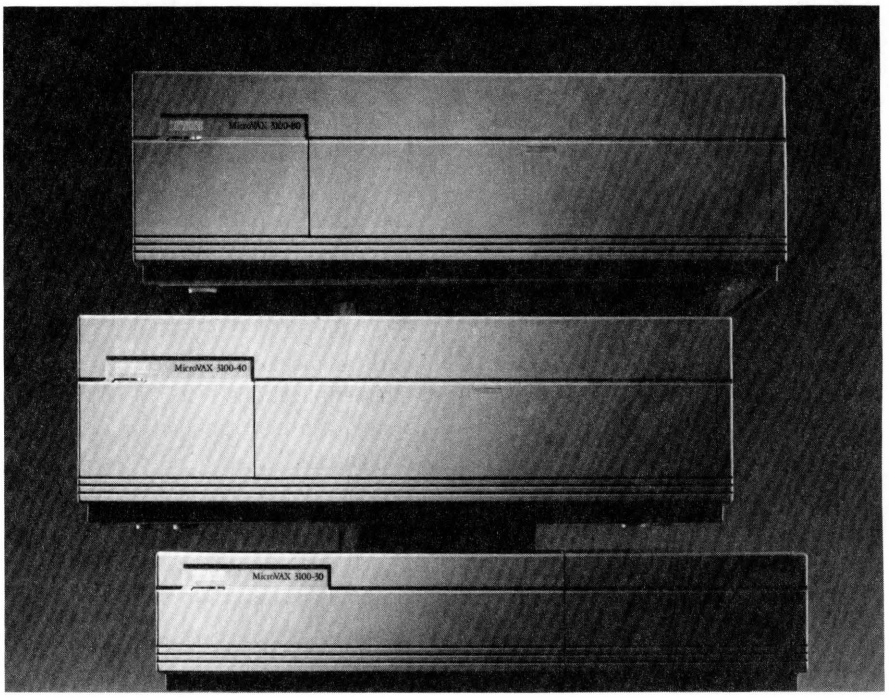
VAXstation 4000 VLC and Models 60 and 90 Monitor Chart

Workstation Grayscale Monitors

Product Northern Hemisphere Southern Hemisphere	**VRM17** **-AA** **-A4**	**VRM17** **-HA** **-H4**	**VR319** **-CA** **-C4**	**VR319** **-DA** **-D4**
CRT Screen size Dot pitch Phosphor Surface treatment	 17-in. FS N/A PC104 Silica	 17-in. FS N/A PC104 Conductive Silica	 19-in. N/A P192 Mechanical Etch	 19-in. N/A P192 Mechanical Etch
Resolution/Refresh Rate (Hz) (All modes are non-interlaced)	1280 × 1024 (72) – – 1024 × 768 (72)	1280 × 1024 (72) – – 1024 × 768 (72)	– 1280 × 1024 (66) – –	1280 × 1024 (72) – – –
Active display Horizontal (maximum) Vertical (maximum)	 295 mm (11.6 in.) 236 mm (9.3 in.)	 295 mm (11.6 in.) 236 mm (9.3 in.)	 342 mm (13.5 in.) 273 mm (10.7 in.)	 342 mm (13.5 in.) 273 mm (10.7 in.)
Connectors Signal Power	 BNC (1) IEC receptacle	 BNC (1) IEC receptacle	 BNC (1) IEC receptacle	 BNC (1) IEC receptacle
Signal cable	Included with system	Included with system	Included with system	Included with system
Power supply AC Auto ranging Consumption	 90–264 V/50–60 Hz Yes 75 W maximum	 90–264 V/50–60 Hz Yes 75 W maximum	 90–264 V/50–60 Hz Yes	 90–264 V/50–60 Hz Yes
Dimensions Height Width Depth	 419 mm (16.5 in.) 406 mm (16.0 in.) 375 mm (14.75 in.)	 419 mm (16.5 in.) 406 mm (16.0 in.) 375 mm (14.75 in.)	 457 mm (18.1 in.) 495 mm (19.5 in.) 401 mm (15.8 in.)	 457 mm (18.1 in.) 495 mm (19.5 in.) 401 mm (15.8 in.)
Weight	16.8 kg (37 lb)	16.8 kg (37 lb)	21.8 kg (48 lb)	21.8 kg (48 lb)
MPRII low-emission monitor	–	Yes	–	–
FCC/VDE/VCCI Class A Class B	 Yes –	 Yes –	 Yes –	 Yes –
UL/CSA/TUV	Yes	Yes	Yes	Yes
DHHS/HWC/PTB	Yes	Yes	Yes	Yes

MicroVAX 3100 Systems and Servers





Product Description

MicroVAX 3100 systems are designed to complement today's VAX offerings. With enhanced distributed computing capabilities and flexibility, they support more than 10,000 commercial and technical applications across local or wide area networks.

MicroVAX 3100 systems offer communications interfaces to support distributed applications. Communications options are available as add-ons to provide expansion capabilities. MicroVAX 3100 systems support synchronous options for wide area communications, and asynchronous options, including modem options for terminal and printer connections. This large-system networking allows communications in a variety of environments, including DECnet, TCP/IP, OSI, SNA, and X.25.

With MicroVAX 3100 systems, greater productivity is available for all desktop systems. PC clients based on MS-DOS, OS/2, and Macintosh can be connected to the MicroVAX 3100 system, enabling the entire business to share information. Digital's advanced client/server computing, based on NAS (Network Application Support), delivers a wide range of solutions to help integrate different desktop workstations and PCs in an organization.

MicroVAX 3100 systems are designed and engineered to handle demanding computing tasks in the open office environment. Factory-loaded operating system software and automatic voltage-sensing power capability make them an ideal choice for any office. Featuring mid-range system performance while retaining compact desktop packaging, MicroVAX 3100 systems require no special facility plans, air conditioning, or power requirements.

MicroVAX 3100 systems support synchronous SCSI transmission in addition to asynchronous SCSI transmission, providing more balanced and higher performance systems.

Product Description
(Continued)

The MicroVAX 3100 Model 30 is designed to support a broad range of computing needs and a large number of users. Its system performance means quick access to files and applications and fast wide area networking.

The MicroVAX 3100 Model 40 offers the same fast performance as the Model 30 but in a more expandable desktop system. Additional internal SCSI storage, asynchronous, synchronous, and modem options can be added to meet current and future application needs. The Model 40 is also an excellent server for multi-PC environments, offering a single source of support for the NAS environment.

The MicroVAX 3100 Model 80 is ideal for organizations that require high performance, expandability, and storage capacity in a desktop system. It runs most applications twice as fast as the Model 30 and Model 40. The Model 80 system can be expanded to 72 Mbytes of memory to meet increased application demands.

The MicroVAX 3100 Model 90 provides the maximum performance for the desktop. The Model 90 has over twice the CPU and Ethernet performance as the Model 80. Memory can be expanded to 128 Mbytes for additional user and application support.

MicroVAX 3100 systems are designed for high availability, sustained reliability, and ease of serviceability. Their compact size provides mid-range systems performance at entry-level system prices.

MicroVAX 3100 Comparison Chart

	Model 30	Model 40	Model 80	Model 90
Performance × VAX 11/780 (VUPS)	5.0	5.0	10.0	24.0
Enclosures	BA42-A	BA42-B	BA42-B	BA42-B
Memory: Included	8 Mbytes	8 Mbytes	8 Mbytes	16 or 64 Mbytes
Maximum	32 Mbytes	32 Mbytes	72 Mbytes	72 or 128 Mbytes
Storage devices (internal maximum)	3	5	5	5
Storage Devices[1] (Total internal and external)	7	7	7	7
Storage Capacity[2]	8.7 Mbytes	8.7 Mbytes	8.7 Mbytes	8.7 Mbytes

[1] Maximum two SZ12 expansion enclosures can be configured with MicroVAX 3100 system—each SZ12 can be configured with up to two storage devices.

[2] Model 30/40/80: three RZ26 1.05-Gbyte devices and four RZ58 1.38-Gbyte devices. (RZ57/RZ58 must be in SZ12 expansion box.)

Step 1—Systems

Select system. Note that disk and tape are not included with traditional and base systems and must be ordered separately. OpenVMS user licenses may be ordered as needed.

MicroVAX 3100 Model 30, Model 40, Model 80, and Model 90 systems include

- Small enclosure with CPU/FPU (Model 30) or large enclosure with CPU/FPU (Model 40, Model 80, and Model 90)
- 8 Mbytes of parity memory: Models 30, 40, 80; 16 or 64 Mbytes of ECC memory: Model 90 (base memory on Models 30 and 40 on CPU; base memory on Models 80 and 90 in DSIM slots)
- 802.3/Ethernet interface (ThinWire/thick wire) with terminators
- Ethernet kit; includes ThinWire T-connector with BNC terminators and 15-pin thick wire terminator
- Synchronous SCSI interface for connecting internal and external SCSI devices; external connection via a 50-pin external SCSI connector
- Three DEC-423 asynchronous serial lines (MMJ data leads only)
- EIA-232 asynchronous serial line with modem control (25-pin D-subminiature connector)
- H8575-A 25-pin-to-MMJ DEC-423 to EIA-232 adapter
- External SCSI terminator
- 7.6-meter (25-foot) console terminal cable
- 120-V power cord (country-specific power cord required for 240-V use; see Step 8)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- Hardware documentation (Model 30: QZ-K44AA-GZ; Models 40, 80, and 90: QZ-K44AB-GZ)
- OpenVMS base license (with POSIX)
- Factory-installed software*
- One full-year product warranty (standard warranty recommended)

*Delivery of the software on a system disk is not warranted. It is provided as a convenience to the customer. Customers are encouraged to purchase the necessary media and documentation kits that include complete installation instructions. See Step 7 for details.

ADVANTAGE-SERVER Systems

- NAS 300 package (with DECnet end-node license and Rdb Runtime license)
- RZ26 1.05-Gbyte disk drive
- RRD42 600-Mbyte CD-ROM drive

Order Number	MicroVAX 3100	Memory
DV-31HCB-DA	Model 80	40 Mbytes
DV-31PCA-EA	Model 90	64 Mbytes

OpenVMS Traditional Systems

- OpenVMS 2-user license
- Rdb Runtime license
- DECnet end-node license

Order Number	MicroVAX 3100	Memory
DV-31FTA-B9	Model 30	8 Mbytes
DV-31GTA-B9	Model 40	8 Mbytes
DV-31HTA-B9	Model 80	8 Mbytes
DV-31PTA-C9	Model 90	16 Mbytes
DV-31PTA-E9	Model 90	64 Mbytes

OpenVMS Base Servers

Order Number	MicroVAX 3100	Memory
DV-31FAA-B9	Model 30	8 Mbytes
DV-31GAA-B9	Model 40	8 Mbytes
DV-31HAA-B9	Model 80	8 Mbytes
DV-31PAA-C9	Model 90	16 Mbytes
DV-31FAA-E9	Model 90	64 Mbytes

Step 2—Storage

Select storage devices as required. See Chapter 7, *Storage Devices*, for further details.

Step 2a—Internal Storage

Configuration Rules

Model 30

- Storage devices are supported in any one of the following combinations:
  - One removable media device and one 3.5-inch half-height
  - One RX2x 3.5-inch half-height and two RZ2x 3.5-inch half-height
  - Three 3.5-inch half-height devices if TLZ06 is not used
- Maximum two tape devices, one internal and one external or two external
- Order a load device if necessary—VAXcluster satellite members or systems being loaded over the network do not require a load device. (One TK50Z or RRD42 is required as a load device if TZ30 storage is not present.)
- Selection of one factory-installed RZ24L, RZ25, or RZ26 required (for Base Systems) for factory-installed software.

Models 40, 80, and 90

- Maximum five internal devices in any one of the following combinations:
  - Five RZ2x
  - Two RRD42, or TLZ06, or TZK10 and three RZ2x
  - Two RX26 and three RZ2x
  - One TZ30 (must be in right cavity) and three RZ2x
- One factory-installed RZ24L, RZ25, or RZ26 is required for factory-installed software.
- Order a load device if necessary—VAXcluster satellite members or systems being loaded over the network do not require a load device. (One TK50Z or RRD42 is required as a load device if TZ30 storage is not present.)
- Field-installed options require Customer Services installation.

Note: Internal RRD42 not supported in Model 30 systems.

RZ25-EN/EK	426-Mbyte 3.5-inch half-height embedded SCSI fixed disk drive; factory/field installed
RZ24L-EJ/EH	245-Mbyte 3.5-inch half-height embedded SCSI fixed disk drive; factory/field installed
RZ23L-EJ/EH	121-Mbyte 3.5-inch half-height embedded SCSI fixed disk drive; factory/field installed
RZ26-EN/EK	1.05-Gbyte 3.5-inch half-height embedded SCSI fixed disk drive; factory/field installed
RX26-EN/EL	2.8-Mbyte diskette drive; factory/field installed
TLZ06-HF/HG	4.0-Gbyte 4mm 3.5-inch DAT drive
TZ30-EK/EL	95-Mbyte streaming tape drive; factory/field installed
TZK10-HF/HG	320/525-Mbyte quarter-inch cartridge (QIC) tape drive; factory/field installed
RRD42-EN/EK	600-Mbyte CD-ROM drive for Models 40, 80, and 90 systems; factory/field installed

Step 2b—External Storage

Configuration Rules

- Maximum two SZ12 dual-drive expansion boxes (a fully populated SZ12 expansion box counts as two devices)
- Maximum seven devices; four can be external
- Maximum SCSI bus length (internal **and** external) is 6 meters (236 inches)

Use the following table to measure the amount of external SCSI bus length; the total must not exceed 4.6 meters (180.6 inches) for Model 30 and 4.2 meters (163.9 inches) for Models 40, 80, and 90. **Note:** The following devices include necessary cables except TZ85; TZ85 requires BC06P cable.

Tabletop Enclosure	Internal Cable Length	External Cable Length
SZ12	0.78 m (31 inches)	0.6 m (24 inches)
RRD42	0.35 m (14 inches)	0.45 m (18 inches)
TK50Z	0.45 m (18 inches)	0.45 m (18 inches)
TLZ04	1.01 m (40 inches)	0.91 m (36 inches)
TLZ06	0.32 m (12.6 inches)	0.91 m (36 inches)
TZ85	0.28 m (11 inches)	

SZ12	Refer to page 7.65 for SZ12 dual-drive expansion box ordering information.
TK50Z-GA/G3*	95-Mbyte 5.25-inch tabletop streaming cartridge tape drive; 120 V/240 V
RRD42-FA/DG*	600-Mbyte 5.25-inch tabletop CD-ROM drive; 120 V/240 V
TLZ06-FA*	4.0-Gbyte 3.5-inch tabletop DAT drive with universal power supply; includes 120-V power cord
TZ85-TA	2.6-Gbyte 5.25-inch tabletop tape drive; requires BC06P cable
BC06P-2F	TZ85 cable, 2.5 ft (0.8 m)
BC06P-06	TZ85 cable, 6 ft (1.8 m)
BC06P-09	TZ85 cable, 9 ft (2.7 m)

* Country-specific power cord required for 240-V use, refer to Chapter 7, *Storage Devices*.

Step 3—Memory

Base systems include 8, 16, or 64 Mbytes of memory—base memory on Models 30 and 40 on CPU; base memory on Models 80 and 90 in first DSIM slot. Model 30 and 40 systems can be expanded to 32 Mbytes of memory, Model 80 systems can be expanded to 72 Mbytes of memory, and Model 90 systems can be expanded to 128 Mbytes of memory.

Digital Single In-Line Memory (DSIM)

MS44L-BA	8 Mbytes of DSIM modules for Model 30, 40, and 80 systems
MS44-DA	32 Mbytes of DSIM modules for Model 80 systems
MS44L-BC	16 Mbytes of DSIM modules for Model 90 systems
MS44-DC	64 Mbytes of DSIM modules for Model 90 systems

MicroVAX 3100 Memory Configuration Chart

			Model 90	
Required Memory	**Models 30 and 40**	**Model 80**	**16-Mbyte Base**	**64-Mbyte Base**
16 Mbytes	1 × MS44L-BA	1 × MS44L-BA	N/A	N/A
24 Mbytes	2 × MS44L-BA	2 × MS44L-BA	N/A	N/A
32 Mbytes	3 × MS44L-BA	N/A	1 × MS44L-BC	N/A
40 Mbytes	N/A	1 × MS44-DA	N/A	N/A
48 Mbytes	N/A	1 × MS44L-BA and 1 × MS44-DA	N/A	N/A
72 Mbytes	N/A	2 × MS44-DA	N/A	N/A
80 Mbytes	N/A	N/A	1 × MS44-DC	1 × MS44L-BC
128 Mbytes	N/A	N/A	N/A	1 × MS44-DC

Step 4—Networks and Communications

Select devices as required. See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for more information.

Host-Based Communications Controllers

Select host-based communications controllers for standalone systems (without LAN connectivity), or for other requirements.

Asynchronous Multiplexer Options

Select one asynchronous multiplexer for communications expansion.

DHW41-BA (Model 30)

Provides four EIA-232 lines for a system total of eight asynchronous lines (three data only and five with modem control). Includes internal logic module with cable, EIA-232 I/O assembly, and external 50-pin to 4-way 25-pin BC29J-06 1.8-m (6-ft) cable; factory or field installed.

DHW41-AA (Model 30)—DHW42-AA (Model 40, Model 80, and Model 90)

Provides eight DEC-423 lines for a system total of 12 asynchronous lines (11 data only and one with modem control). Includes internal logic module with cable, DEC-423 I/O assembly, external 36-pin BC16C-10 3-m (10-ft) cable, and H3104-00 eight-line distribution harmonica; factory or field installed.

DHW42-CA (Model 40, Model 80, and Model 90)

Provides eight EIA-232 lines for a system total of 12 asynchronous lines (three data only and nine with modem control). Includes internal logic module with cable, EIA-232 I/O assembly, and two external 50-pin to 4-way 25-pin BC29J-06 1.8-m (6-ft) cables; factory or field installed.

DHW42-BA (Model 40, Model 80, and Model 90)

Provides 16 DEC-423 lines for a system total of 20 asynchronous lines (19 data only and one with modem control). Included internal logic module with cable, DEC-423 I/O assembly, two external 36-pin BC16C-10 3-m (10-ft) cables, and two H3104-00 eight-line distribution harmonica; factory or field installed.

Step 4—Networks and Communications *(Continued)*

DHW42-UP (Model 40, Model 80, and Model 90)
Upgrades DHW42-AA to DHW42-BA; field installed only.

Note: Addition of DHW4x options increases number of users; a VMS license upgrade may be required.

Synchronous Communications Option

Configuration Rules

- Select ONE synchronous option.
- EIA-232/V.24 cable (BC19D-02) is included—select alternate cables for EIA-423/V.10 and EIA-422/V.11 connection.

DSW41-AA (Model 30)—DSW42-AA (Model 40, Model 80, and Model 90)
EIA-232 synchronous controller (DSW41-AA provides one line; DSW42-AA provides two lines). Includes synchronous logic module, I/O assembly, and external EIA-232 0.6-m (2-ft) adapter cable.

BC19B-02	EIA-422/V.11 0.6-m (2-ft) adapter cable
BC19E-02	EIA-423/V.10 0.6-m (2-ft) adapter cable
QL-VAWA9-AA	One-time single-user VAX WAN Device Driver license for use of synchronous port
QA-VAWAA-H5	VAX WAN Device Drivers media (TK50) and documentation

Note: VAX WAN Device Driver included in VMS Consolidated Software Disk CD-ROM media. See Step 7 for details. VAX WAN Device Driver V1.2 or higher required.

LAN Communications Controller
802.3/Ethernet Interface (ThinWire/thick wire selectable) included with system. Connection of system to Ethernet requires a ThinWire BNC connection (e.g., BC16M cable) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x).

Local and Wide Area Communications Servers
Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M cable) or a thick wire 15-pin AUI transceiver cable is required (e.g., BNE3x). Software media and documentation and cables are also required. See description in Chapter 6, *Networks, Communications, and Cables*, for ordering information.

DECserver 90L+, 700, 250, and MUXserver 300, 310, 380 Terminal and Printer Servers
Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize on a LAN, to minimize cabling complexity and costs, and to conserve host resources such as backplane slots.

DEC WANrouter 150, 250, 500, and TransPATH 335, 350 Multiprotocol Routers
Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products
See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide.*

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., VT420) for each system unless otherwise available. If logging is required, a combination of video terminal and LA75 is recommended. See Chapter 8, *Terminals and Printers*, for ordering information.

Step 6—Terminals and Printers

Select terminals and serial printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided. See Chapter 8, *Terminals and Printers*, for ordering information.

Step 7—Software

Licenses required to support additional users beyond those included in base systems.

Software Processor Code	MicroVAX 3100 = **P**
ClusterWide License Rating	MicroVAX 3100 = **20 (C)**

OpenVMS User Licenses

QL-XULA9-BB	OpenVMS/VAX interactive one-user license
QL-XULA9-BC	OpenVMS/VAX interactive two-user license
QL-XULA9-BD	OpenVMS/VAX interactive four-user license
QL-XULA9-BE	OpenVMS/VAX interactive eight-user license
QL-XULA9-BF	OpenVMS/VAX interactive 16-user license
QL-XULA9-BG	OpenVMS/VAX interactive 32-user license
QL-XULA9-BH	OpenVMS/VAX interactive 64-user license
QL-XULAA-BR	OpenVMS/VAX interactive 128-user license
QL-XULAB-BR	OpenVMS/VAX interactive 256-user license
QL-VBRAP-AA	VAXcluster license for multiuser systems

Software Media and Documentation

Choose operating system media and documentation. One required for first system on site. System support for Models 30/40/80 requires V5.5 or higher; Model 90 requires V5.5-2.

QA-001AA-Hx	OpenVMS media with extended documentation.
QA-09SAA-Hx	OpenVMS media with base documentation.

Note: x denotes the media type: 5 = TK50, 8 = CD-ROM

OpenVMS Consolidated Software Media and Documentation

Choose as an alternative to the above OpenVMS kits. Requires RRD42 CD-ROM.

QA-VWJ8A-A8	OpenVMS and layered product binaries on CD-ROM without hardcopy documentation, not available for Model 90 systems.
QA-VYR8A-G8	OpenVMS extended online documentation and layered product online documentation on CD-ROM; requires DECwindows Bookreader, not available for Model 90 systems.

QA-358AA-Hx	Rdb Runtime media and documentation
QA-GXXAA-Hx	POSIX media and documentation (with IEEE documentation)
QA-GXXAB-Hx	POSIX media and documentation (without IEEE documentation)

Select the appropriate NAS software level. See description of NAS packages on page 9.2. **Note:** The NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit
QL-MC2A*-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit

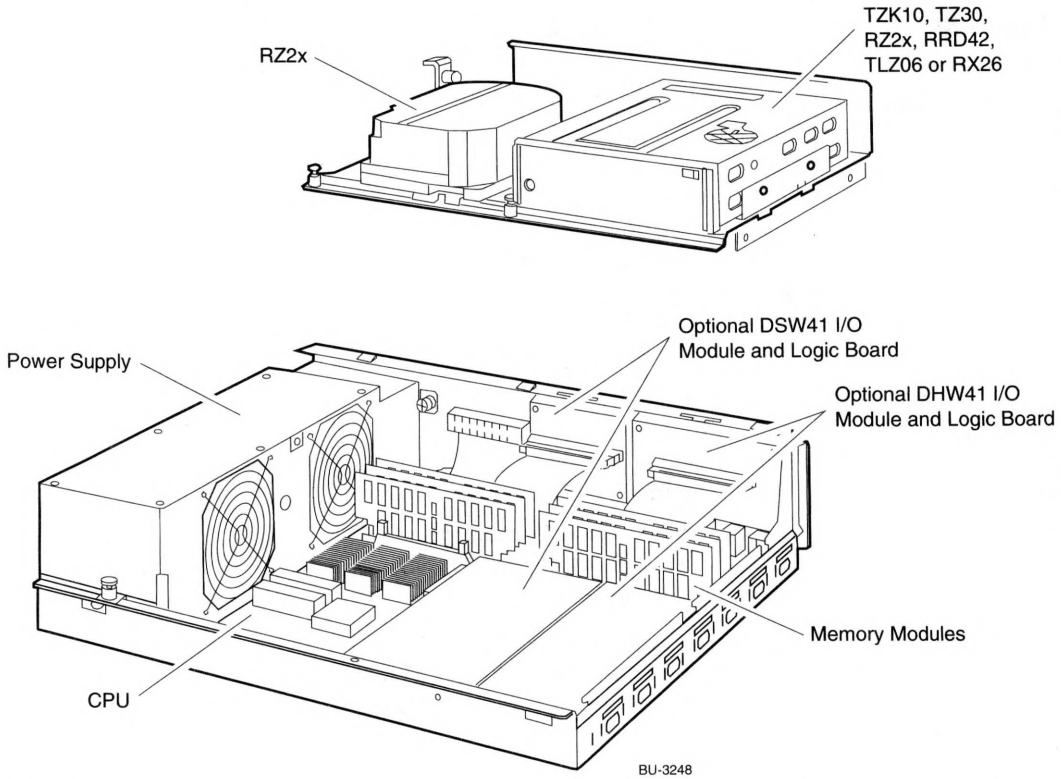
Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape, * = processor code

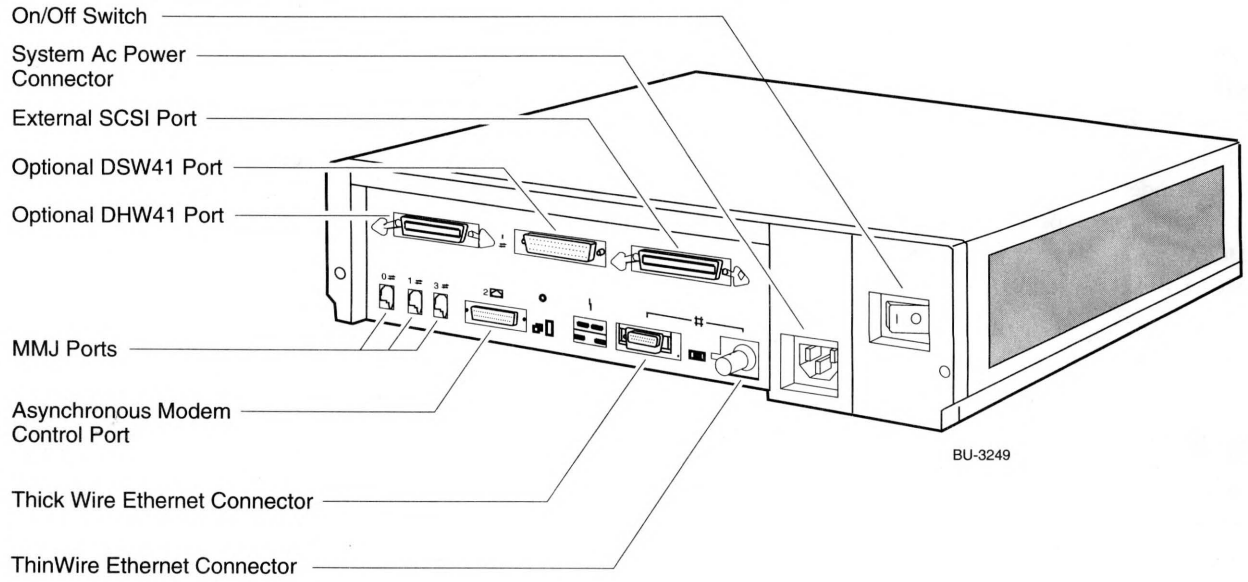
Step 8—Power Cords

Select for 220/240-V systems.

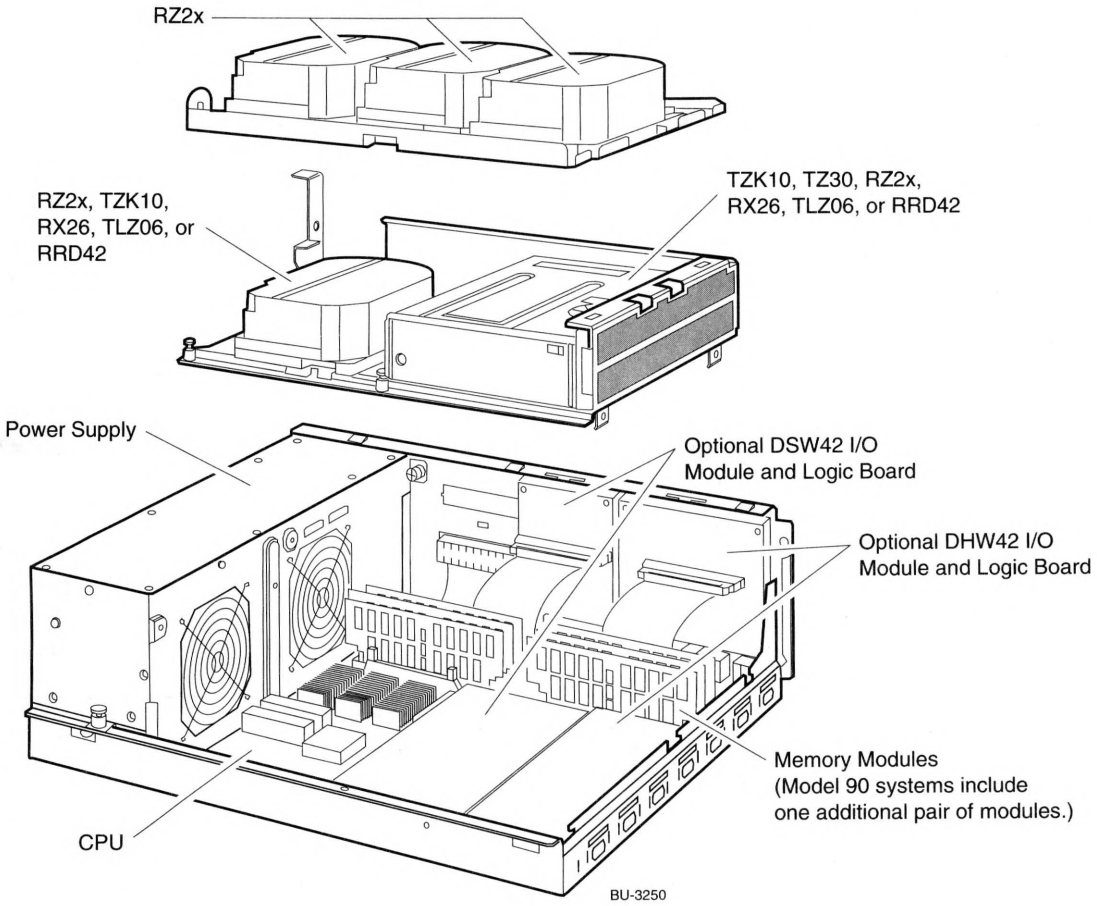
BN19A-2E	U.K./Ireland
BN19C-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, and Spain
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19U-2E	Israel
BN19H-2E	Australia, New Zealand
BN19S-2E	India

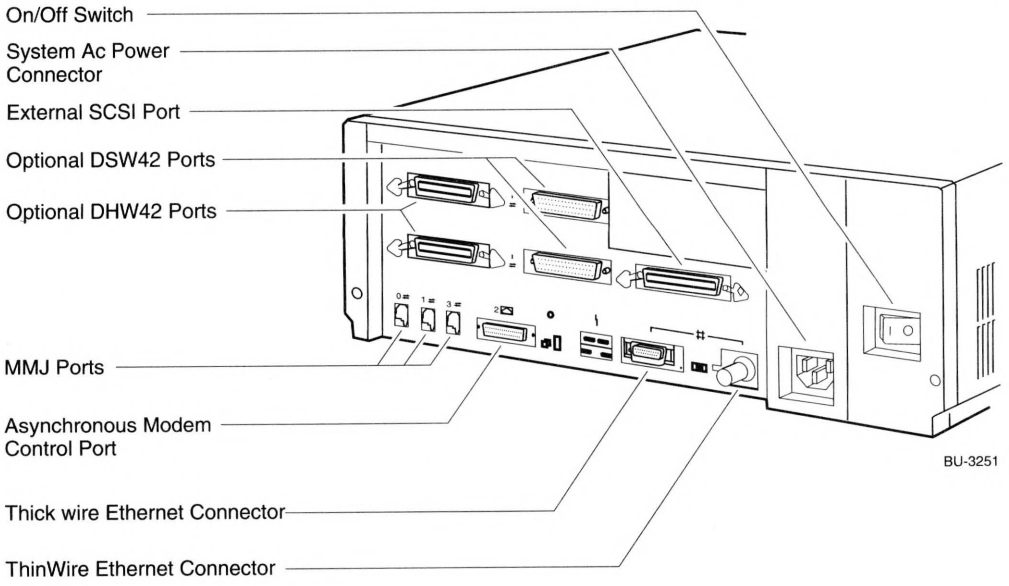
MicroVAX 3100 Model 30 System Diagram





MicroVAX 3100 Models 40, 80, and 90 System Diagrams





Specifications

Physical Characteristics	Model 30	Models 40, 80, 90
Height	9.90 cm (3.90 in.)	14.99 cm (5.90 in.)
Width	46.38 cm (18.26 in.)	46.38 cm (18.26 in.)
Depth	39.42 cm (15.52 in.)	40.00 cm (15.75 in.)
Weight	11.40 kg (25.00 lb)[2]	18.40 kg (40.00 lb)[3]

Power Requirements	Model 30	Model 40	Model 80	Model 90
Nominal voltage	110/240 Vrms	110/240 Vrms	110/240 Vrms	120/240 Vrms
Power source phasing	Single	Single	Single	Single
Nominal frequency	50–60 Hz	50–60 Hz	50–60 Hz	50–60 Hz
Voltage range	88–132 Vrms	88–132 Vrms	88–132 Vrms	88–132 Vrms
	176–264 Vrms	176–264 Vrms	176–264 Vrms	176–264 Vrms
Line frequency tolerance	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Typical running current	1.0/0.55 A	1.1/0.6 A	1.2/0.65 A	1.5/0.75 A
Typical power consumption	120/132 VA	132/144 VA	144/156 VA	180 VA
Standard Communication				
Minimum MMJ lines	3 DEC-423	3 DEC-423	3 DEC-423	3 DEC-423
Modem lines	1 EIA-232	1 EIA-232	1 EIA-232	1 EIA-232
Ethernet	Thick wire and ThinWire supported on all models			
Communications Options				
MMJ lines	8 DEC-423	8 DEC-423	8 DEC-423	8 DEC-423
MMJ lines	–	16 DEC-423	16 DEC-423	16 DEC-423
Modem lines	4 EIA-232	8 EIA-232	8 EIA-232	8 EIA-232
Synchronous lines	1 synchronous	2 synchronous	2 synchronous	2 synchronous
Operating Environment	Temperature (sea level) 10°–40°C (50°–90°F) Relative humidity 10%–90% noncondensing Maximum operating altitude 2.4 km (8,000 ft)			

[1] DEC-423, EIA-232 and synchronous lines can be ordered separately. The DEC-423 and EIA-232 options cannot be configured together in the same system. An 8-line DEC-423 to 16-line DEC-423 upgrade option is available for the MicroVAX 3100 Model 40 and Model 80 systems.
[2] Approximate weight with one disk.
[3] Approximate weight with three disks.

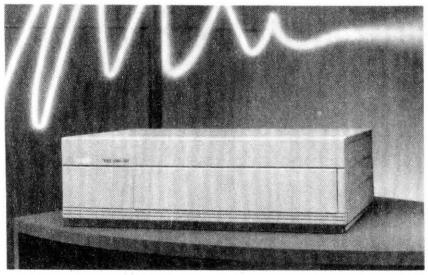
All software must be upgraded to the latest revision when upgrading from server to timeshare systems. The following upgrades replace the CPU in the existing system enclosure.

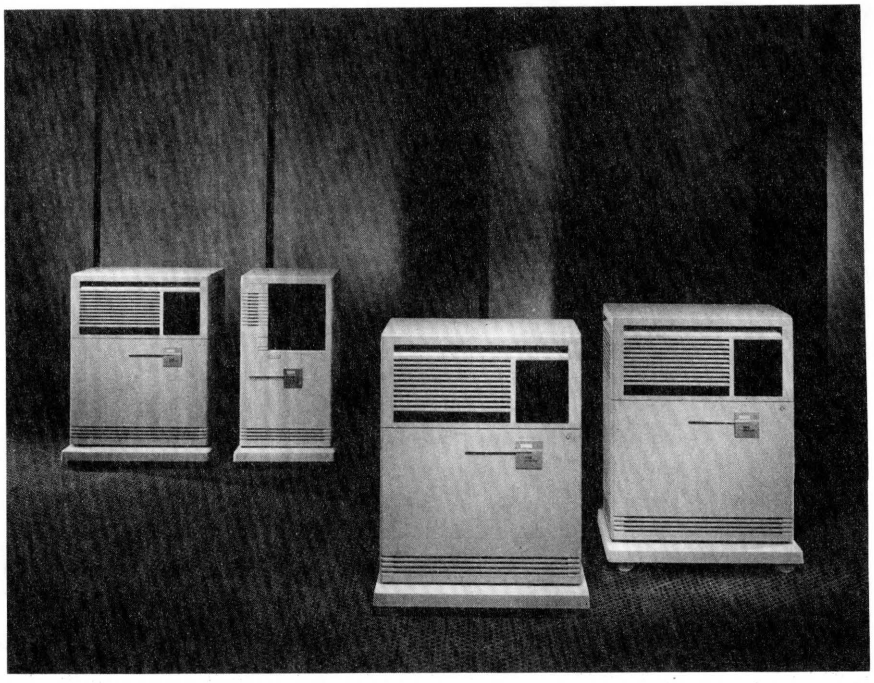
From	To	Order Number	Includes:
VAXserver 3100 Model 10 or 20	VAXserver 3100 Model 10e or 20e	**310XR-EA**	VMS File and Application Server license and DECnet end-node license
MicroVAX 3100 Model 10 or 20	MicroVAX 3100 Model 10e or 20e	**310XR-EB**	VMS 1- to 5-user license, and DECnet end-node license.
VAXserver 3100e	MicroVAX 3100e	**310XR-AD**	VMS 1- to 5-user license, and DECnet end-node license.

Note: MicroVAX 3100 Model 90 systems require 16 Mbytes of main memory. 8-Mbyte memory embedded on Model 40 and Model 80 CPU cannot be transferred; 4-Mbyte and 16-Mbyte DSIMs from Model 40 and Model 80 can be transferred to Model 90 in sets of four ONLY (e.g., two MS44L-BA = 4 × 4-Mbyte SIMMs—Model 90 memory modules must be installed in sets of four matching DSIM values).

MicroVAX 3100 Model 40	MicroVAX 3100 Model 90	**47GEX-C9**	16 Mbytes of memory, two OpenVMS user licenses, and DECnet end-node license.
MicroVAX 3100 Model 40	MicroVAX 3100 Model 90	**47GEX-E9**	64 Mbytes of memory, two OpenVMS user licenses, and DECnet end-node license.
MicroVAX 3100 Model 80	MicroVAX 3100 Model 90	**47HEX-C9**	16 Mbytes of memory, two OpenVMS user licenses, and DECnet end-node license.
MicroVAX 3100 Model 80	MicroVAX 3100 Model 90	**47HEX-E9**	64 Mbytes of memory, two OpenVMS user licenses, and DECnet end-node license.
MicroVAX 3100 Model 40	MicroVAX 3100 Model 80	**47XR-AA**	VMS 1- to 2-user license, and DECnet end-node license.

VAX 4000 Systems and Servers





Product Description

VAX 4000 systems provide unprecedented commercial systems performance, high availability, and a compact footprint for deployment flexibility. They also support a wide range of business-enhancing applications and options, including *Token* Ring networks and a wide variety of Q-bus peripherals. VAX 4000 systems offer growth and flexibility, as well as investment protection through board upgrades, memory and storage expansion, and the ability to create DSSI VAXcluster systems.

VAX 4000 systems derive their outstanding performance from a powerful CMOS-based CPU, as well as an enhanced cache and memory subsystem. DSSI and Ethernet adapter chips—each driven by a 10-MIP on-chip RISC processor—are tightly integrated on the CPU module and have direct access to memory. Digital's DSSI disk technology offers dedicated cache and an embedded controller on each disk, enabling linear I/O performance as disks are added to the system. With balanced I/O, VAX 4000 systems deliver superior application response time.

Because of their balanced and scalable performance, VAX 4000 systems are well suited for a variety of commercial applications. Typical environments include banking and finance, insurance, health care, manufacturing, and retail/wholesale industries. VAX 4000 systems' architecture, combined with the OpenVMS operating system and a myriad of application solutions, offers a processing environment flexible enough to embrace client/server and "rightsizing" trends, as well as the ability to adapt to emerging technologies.

The VAX 4000 Model 100 is offered in a desktop enclosure, and Models 200, 300, 400, 500 and 600 are packaged in a deskside pedestal. All VAX 4000 systems are designed to operate in a office environment and offer superb ease of use and installation. Since no special room conditioning or power requirements are necessary, the VAX 4000 can save significant annual facility costs.

VAX 4000 systems are also available in rackmount models. A rackmount solution is ideal where workspace is at a premium. Rackmount systems offer the opportunity to start with a single system in a rackmount chassis and add systems vertically in a single cabinet to a two- or three-system DSSI VAXcluster configuration. The power of three VAX 4000 Model 600 systems (96 VUPs), supported by a nearly unlimited array of disk and tape configurations can be housed in 4.5 square feet of floor space.

Product Description
(Continued)

A DSSI VAXcluster system provides high data and system availability by joining Q-bus VAX 4000, VAX 6000, and VAX 7000 systems via DSSI. Each system can access and share all disks attached to the DSSI buses. This provides multiple paths to the data, increasing data availability. Should one system in a DSSI VAXcluster configuration fail, data is available to serve systems via the other paths, and all I/O operations can resume immediately. No application rewrite is required across high-availability options, and systems can be expanded without disruption to existing operations.

Multi-host DSSI VAXcluster systems are commonly used as boot nodes for local area VAXcluster systems, or as multiuser systems with terminal servers. Packaged DSSI VAXcluster systems are available. Refer to system ordering menus for ordering information.

VAX 4000 Comparison Chart

	Model 100 (BA42B)	Model 200 (BA215)	Model 200 (BA430)	Model 300 (BA440)	Model 400 (BA440)	Model 500 (BA440)	Model 600 (BA440)
Minimum supported version of OpenVMS	5.5-2	5.4-2	5.4-2	5.3-2	5.5-2	5.5	5.5
Performance × VAX-11/780 (VUPs)	24	5	5	8	16	24	32
Maximum memory	128 Mbytes	64 Mbytes	64 Mbytes	256 Mbytes	512 Mbytes	512 Mbytes	512 Mbytes
Maximum storage (Note 5)							
System enclosure (internal)	2.6 Gbytes	2 Gbytes	8 Gbytes	8 Gbytes	8 Gbytes	8 Gbytes	8 Gbytes
Expansion pedestal (external)	36.0 Gbytes	40 Gbytes	34 Gbytes	48 Gbytes	48 Gbytes	48 Gbytes	48 Gbytes
Total	38.6 Gbytes[7]	42 Gbytes (DSSI)	42 Gbytes (DSSI)	56 Gbytes (DSSI)	56 Gbytes (DSSI)	56 Gbytes (DSSI)	56 Gbytes (DSSI)
Maximum disk I/O throughput	1200 I/Os per second	1180 I/Os per second	1180 I/Os per second	1980 I/Os per second	2780 I/Os per second	2780 I/Os per second	2780 I/Os per second
Q-bus slots available	N/A[3]	4	10	7	7	7	7
Maximum possible Q-bus slots (with B400X expansion pedestals)	11	14	20	17	17	17	17
Maximum Tape Configurations:							
TF85	2 (Note 3)	6 (Notes 4 & 5)	6 (Note 4)	8 (Note 4)	8 (Note 4)	8 (Note 4)	8 (Note 4)
TLZ06	2 (Note 8)	4 (Note 2)	4 (Note 2)	4 (Note 2)	4 (Note 2)	4 (Note 2)	4 (Note 2)
TK70	1 (Note 3)	2 (Note 1)	2 (Note 1)	2 (Note 1)	2 (Note 1)	2 (Note 1)	2 (Note 1)
TK50	1 (Note 3)	2 (Note 1)	2 (Note 1)	2 (Note 1)	2 (Note 1)	2 (Note 1)	2 (Note 1)
TU81E	1 (Note 3)	2 (Note 3)	2 (Note 3)	2 (Note 3)	2 (Note 3)	2 (Note 3)	2 (Note 3)
TSV05	1 (Note 3)	1 (Note 3)	1 (Note 3)	1 (Note 3)	1 (Note 3)	1 (Note 3)	1 (Note 3)
TSZ07	1 (Note 3)	2 (Note 6)	2 (Note 6)	2 (Note 6)	2 (Note 6)	2 (Note 6)	2 (Note 6)

Notes:
1. One TK70/TK50 in BA4xx (system enclosure), one in B400X.
2. Supported in tabletop model only.
3. In separate cabinet or enclosure.
4. One per enclosure (BA4xx, B400X, R400X); maximum two per DSSI bus; embedded or tabletop.
5. Not supported in BA215 system enclosure.
6. One per KZQSA adapter.
7. If no internal disk storage is configured, maximum DSSI disk capacity is 42 Gbytes (i.e., three DSSI adapters—embedded and two KFQSAs, 21 RF73 disks, three R400X, and one B400X expansion pedestals).
8. One in BA42B, one in tabletop enclosure.

Product Description *(Continued)*

The following chart lists tape or CD-ROM devices that can be used as boot[1] and load[2] devices:

Device	Model 100 (BA42B)	Model 200 (BA215)	Model 200 (BA430)	Model 300 (BA440)	Model 400 (BA440)	Model 500 (BA440)	Model 600 (BA440)
RRD40	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load
RRD42	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load
TF85	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load
TK50E	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load
TK70E	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load	Boot/Load
TU81E	Boot/Load[3]	Boot/Load[3]	Boot/Load[3]	Boot/Load[3]	Boot/Load[3]	Boot/Load[3]	Boot/Load[3]
TLZ06	Boot	Boot	Boot	Boot	Boot	Boot	Boot
TSV05	Load[3]	Load[3]	Load[3]	Load[3]	Load[3]	Load[3]	Load[3]
TSZ07	Load[3]	Load[3]	Load[3]	Load[3]	Load[3]	Load[3]	Load[3]

Notes:

1. A "boot" device is defined as a device that is supported by *both* the hardware system's VMB bootstrap facility (console level "BOOT" command) *and* the VMS operating system STABACKIT utility.
2. A "load" device is defined as a device that supports the media on which Digital distributes software.
3. Requires a TK50-compatible tape drive unit in order to support the initial loading of VMS operating system from magtape media. The TK50 media contains a bootable image to install the magtape contents of the consolidated VMS kit, i.e., QA-001AG-HM or QA-09SAG-HM.

Step 1—VAX 4000 Model 100 Systems

Select system. Note that disk and tape are not included in base systems and must be ordered separately. OpenVMS user licenses may be ordered as needed.

VAX 4000 Model 100 systems include

- CPU with embedded DSSI, 802.3/Ethernet (ThinWire/thick wire), and synchronous SCSI adapters
- BA42B tabletop enclosure
  - Q-bus adapter for connecting to an external Q-bus enclosure
  - Three dedicated slots for RF3x drives
  - Two dedicated slots for removable media storage
  - Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac.
- 16 or 64 Mbytes of ECC memory. 16-Mbyte base systems can be expanded to 80 Mbytes of memory; 64-Mbyte base systems can be expanded to 128 Mbytes of memory.
- Three DEC-423 asynchronous serial lines (MMJ data leads only)
- H8575-A 25-pin-to-MMJ DEC-423 To EIA-232 adapter
- 7.6-m (25-ft) console terminal cable
- 120-V power cord (country-specific power cord required for 240-V use; see Step 8)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- Factory-installed software* (VAX 4000 Model 100 systems include OpenVMS V5.5-2 operating system—TK50 and CD-ROM media—and base documentation)
- OpenVMS base license (with POSIX)
- One full-year product warranty (standard warranty recommended)
- Hardware documentation

*Delivery of the software on a systems disk is not warranted. It is provided as a convenience to the customer. Customers are encouraged to purchase the necessary media and documentation kits that include complete installation instructions. See Step 7 for details.

ADVANTAGE-SERVER Systems

- NAS 300 Package (with DECnet end-node license and Rdb Runtime license)
- RRD42 600-Mbyte CD-ROM drive

DV-41MCA-CA	Model 100 with 16 Mbytes of memory and RF31T 381-Mbyte DSSI disk drive
DV-41MCA-EA	Model 100 with 64 Mbytes of memory and RF35 852-Mbyte DSSI disk drive

ADVANTAGE-SERVER DSSI VAXcluster Systems

- NAS 300 package (with DECnet end-node license and Rdb Runtime license)
- OpenVMS base license per system
- OpenVMS licenses for 20 users per system
- VAXcluster software license per system
- DECnet full-function license
- 2.7-meter (9-foot) DSSI bus cable (BC21M-09)

DV-41MBC-C9	Model 100 with 16 Mbytes of memory per system
DV-41MCB-E9	Model 100 with 16 Mbytes of memory per system

OpenVMS Traditional Systems

- DECnet end-node license
- Rdb Runtime license

DV-41MT1-C9	Model 100 with 16 Mbytes of memory and OpenVMS licenses for 10 users
DV-41MT1-E9	Model 100 with 64 Mbytes of memory and OpenVMS licenses for 20 users

OpenVMS Base Servers

DV-41MAA-C9	Model 100 with 16 Mbytes of memory
DV-41MAA-E9	Model 100 with 64 Mbytes of memory

Step 2—Storage

Select storage devices as required. See Chapter 7, *Storage Devices,* for further information on devices listed.

Step 2a—Internal Storage

Configuration Rules

- Selection of one DSSI disk (ISE) is required for factory-installed software.
- Order load device if required—VAXcluster satellite members or systems being loaded over the network do not require a load device.
- Maximum three 3.5-inch DSSI ISEs (RF31T, RF35) and two half-height 5.25-inch removable media devices (TZ30, TZK10, RX26, RRD42) can be housed inside the BA42B system enclosure.
- Single systems support seven ISEs per DSSI adapter; two-system DSSI VAXcluster configurations support six DSSI ISEs and can be connected between any pair of DSSI adapters (one adapter in each system).
- Field-installed options require Customer Services installation.

Fixed Media Devices

RF31T-EN/EK	381-Mbyte 3.5-inch full-height embedded DSSI disk drive; factory/field installed
RF35-EN/EK	852-Mbyte 3.5-inch full-height embedded DSSI disk drive; factory/field installed

Removable Media Devices

RX26-EN/EL	2.8-Mbyte diskette drive; factory/field installed
TZ30-EK/EL	95-Mbyte streaming tape drive; factory/field installed
TZK10-HF/HG	320/525-Mbyte quarter-inch cartridge (QIC) tape drive; factory/field installed
RRD42-EN/EK	600-Mbyte CD-ROM drive; factory/field installed
TLZ06-HF/HG	4.0-Gbyte DAT drive; factory/field installed

Step 2b—External Storage and Q-bus Expansion

Configuration Rules

- Q-bus expansion (B400X)is required to support KFQSA, KDA50, KLESI or KZQSA storage adapters/controllers.
- To achieve maximum storage capacity of 42 Gbytes of DSSI disk storage, two additional KFQSAs and a Q-bus expander enclosure are required.
- Two Q-bus storage adapters are supported with an external Q-bus enclosure; two KFQSAs, two KDA50s, or one of each; as well as up to two KZQSAs.
- Two KLESI (TU81E) storage controllers are supported with an external Q-bus enclosure.
- One TKxx tape drive is supported in B400X expansion pedestal.
- Full-height 5.25-inch DSSI ISEs and TF85 DSSI tape drives are supported in R400X or B400X expansion pedestals.
- B400X and R400X expansion pedestals include:
  - Q-bus extender modules and two 2.7-meter (9-foot) cables (B400X)
  - 2.7-meter (9-foot) DSSI cable (BC21M-09)
  - 1.8-meter (6-foot) KZQSA cable (BC06P-06)
  - 3.0-meter (10-foot) power control cable (BC09F-10)
  - Universal power supply
  - 120-V power cord (220/240-V use requires a country specific power cord; see Step 8)
- Maximum four DSSI expansion pedestals or TF85 tabletops in any combination per configuration.

B400X and R400X Expansion Pedestals

Refer to page 1.81 (expansion diagrams) and page 1.82 for more information.

B400X-B9	Provides ten additional Q-bus slots and space for RF-series disk drives and one TKxx or TF85 tape drive; factory or field installed
H4010-AA	Cable kit required with B400X-B9
R400X-B9	Provides space for RF-series disk drives and one TF85 tape drive; factory or field installed
H4010-AA	Cable kit required with R400X-B9

DSSI Adapter

KFQSA-SE/SG	Q-bus-to-DSSI adapter. Uses one Q-bus slot (in B400X expansion pedestal); factory/field installed.

Step 2b—External Storage and Q-bus Expansion *(Continued)*

Integrated Storage Elements (ISEs) for B400X or R400X Pedestals

RF31T-AA/AF	381-Mbyte ISE in full-height assembly, expandable to two ISEs; factory/field installed
RF312-AA/AF	Two 381-Mbyte ISEs in full-height assembly
RF35E-AA/AF	852-Mbyte ISE in full-height assembly, expandable to two ISEs; factory/field installed
RF352-AA/AF	Two 852-Mbyte ISEs in full-height assembly
RF72E-AA/AF	1-Gbyte ISE in full-height assembly
RF73E-AA/AF	2-Gbyte ISE in full-height assembly

Tape Drive for B400X or R400X Pedestals

TF85E-JA/JF	2.6-Gbyte embedded cartridge tape drive; factory/field installed. Also available as a tabletop option. Refer to Chapter 7, *Storage Devices*, for ordering information.
TK70E-AA/AF	296-Mbyte embedded cartridge tape drive for B400X (not supported in R400X); requires TQK70-SA controller; factory/field installed
TQK70-SA/SF	TK70E controller; factory/field installed
TK50E-AA/AF	95-Mbyte embedded cartridge tape drive for B400X (not supported in R400X). Requires TQK50 controller; factory/field installed.
TQK50-SA/SF	TK50E controller; factory/field installed.

RSE Storage Expansion Pedestals

RSE storage expansion pedestals include 2.7-m (9-ft) DSSI cable, documentation, one RSE and space for one additional RSE.

RF72B-KA	Same as above except includes RF72 RSE
RF73B-KA	Same as above except includes RF73 RSE

Note: For 240-V use, a country-specific power cord is required. Refer to Chapter 7 for ordering information.

RSEs for RSE Storage Expansion Pedestals

RF72-RA	1-Gbyte RSE in individual removable canister
RF73-RA	2-Gbyte RSE in individual removable canister; requires VMS V5.5

SDI Disk Controller

KDA50-SE/SG	Provides connections for four external RA-disk drives (except RA70/RA71); uses three Q-bus slots in B400X expansion pedestal; factory/field installed. Refer to Chapter 7, *Storage Devices,* for RA-disk descriptions and ordering information.

Tabletop Storage Devices

SZ12	Refer to Chapter 7, *Storage Devices,* for ordering information
TK50Z-GA/G3*	95-Mbyte 5.25-inch streaming cartridge tape drive; 120/240 V
RRD42-FA/DG*	600-Mbyte CD-ROM drive; 120/240 V
TLZ06-GA*	4.0-Gbyte 5.25-inch DAT drive with universal power supply—includes 120-V power cord
TF85-TA*	2.6 Gbyte 5.25-inch DSSI tabletop tape drive
TZ85-TA*	2.6 Gbyte 5.25-inch SCSI tabletop tape drive; requires BC06P cable
BC06P-2F	TZ85 cable, 2.5 ft (0.8 m)
BC06P-06	TZ85 cable, 6 ft (1.8 m)
BC06P-09	TZ85 cable, 9 ft (2.7 m)

* Country-specific power cord required for non-120-V use. Refer to Chapter 7, *Storage Devices,* for ordering information.

Step 3—Memory

Base systems include 16 or 64 Mbytes of memory. Select additional memory as required. 16-Mbyte-based systems can be expanded to 80 Mbytes of memory; 64-Mbyte-based systems can be expanded to 128 Mbytes of memory.

MS44L-BC	16 Mbytes of memory (4 × 4-Mbyte DSIM modules)
MS44-DC	64 Mbytes of memory (4 × 16-Mbyte DSIM modules)

VAX 4000 Model 100 Memory Configuration Chart

The memory increments listed in the "Required Memory" column are the only supported memory configurations.

Required Memory	16-Mbyte Based Systems	64-Mbyte Based Systems
32 Mbytes	1 × MS44L-BC	N/A
80 Mbytes	1 × MS44-DC	1 × MS44L-BC
128 Mbytes	N/A	1 × MS44-DC

Step 4—Networks and Communications

Select communications options as required. See Chapter 6, *Networks, Communications, and Cables,* and the *Networks Buyer's Guide* for more information.

Host-Based Communications Controllers

Select host-based communications controllers for standalone systems (without LAN connectivity), or for other requirements.

Asynchronous Multiplexer Options

Select one asynchronous multiplexer for communications expansion.

DHW42-AA	Provides eight DEC-423 lines for a system total of 12 asynchronous lines (11 data only and one with modem control). Includes internal logic module with cable, DEC-423 I/O assembly, external 36-pin 3-meter (10-foot) cable (BC16C-10), and H3104-00 eight-line distribution harmonica; factory or field installed.
DHW42-CA	Provides eight EIA-232 lines for a system total of 12 asynchronous lines (three data only and nine with modem control). Includes internal logic module with cable, EIA-232 I/O assembly, and two 1.8-meter (6-foot) external 50-pin to 4-way 25-pin (BC29J-06) cables; factory or field installed.
DHW42-BA	Provides 16 DEC-423 lines for a system total of 20 asynchronous lines (19 data only and one with modem control). Includes internal logic module with cable, DEC-423 I/O assembly, two external 36-pin 3-meter (10-foot) cables (BC16C-10), and two H3104-00 eight-line distribution harmonica; factory or field installed.
DHW42-UP	Upgrades DHW42-AA to DHW42-BA; field installed only.

Synchronous Communications Option

Configuration Rules

- Select ONE synchronous option
- EIA-232 synchronous cable (BC19D-02 is included—select alternate cables for EIA-423/V.10 and EIA-422/V.11 connection)

DSW42-AA	EIA-232 synchronous controller—provides two lines. Includes synchronous logic module, I/O assembly, and external 0.6-meter (2-foot) EIA-232 adapter cable.
BC19B-02	EIA-422/V.11 0.6-meter (2-foot) adapter cable
BC19E-02	EIA-423/V.10 0.6-meter (2-foot) adapter cable
QL-VAWA9-AA	One-time single-user VAX WAN Device Driver license for use of synchronous port
QA-VAWAA-H5	VAX WAN Device Driver media (TK50) and documentation

Note: VAX WAN Device Driver included in OpenVMS consolidated software disk CD-ROM media; see Step 7 for details. VAX WAN Device Driver V1.2 or higher required.

LAN Communications Controller

802.3/Ethernet interface (ThinWire/thick wire selectable) included with system. Connection of system to Ethernet requires a ThinWire BNC connection (e.g.; BC16M cable) or a thick wire 15-pin AUI transceiver cable (e.g.; BNE3x).

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Software media, documentation, and cables are also required. See descriptions in Chapter 6, *Networks, Communications, and Cables,* for ordering information.

DECserver 90L+, 90TL, 700, 250 and MUXserver 300, 310, 320, 380 Terminal and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources.

DEC WANrouter 250, 500; DEC Network Integration Server 500,600; Proteon 4100+, CNX 500; TransPATH 335, 350 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products

See Chapter 6, *Networks, Communications, and Cables,* and the *Networks Buyer's Guide.*

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., VT420) for each system unless otherwise available. See Chapter 8, *Terminals and Printers,* for ordering information. **Note:** One console terminal required per system. A VT330/VT340/VT420 with split screen capability can be used as a shared console terminal.

Step 6—Terminals and Printers

Select terminals and printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided. Maximum two parallel printers per LPV11 controller; maximum two controllers per system which require one Q-bus slot each. See Chapter 8, *Terminals and Printers,* for ordering information.

Step 7—Software

Software Processor Code: VAX 4000 Model 100 = **S**
Clusterwide License Rating: VAX 4000 Model 100 = **100 (E)**

OpenVMS User Licenses

QL-XULA9-BB	OpenVMS/VAX interactive one-user license
QL-XULA9-BC	OpenVMS/VAX interactive two-user license
QL-XULA9-BD	OpenVMS/VAX interactive four-user license
QL-XULA9-BE	OpenVMS/VAX interactive eight-user license
QL-XULA9-BF	OpenVMS/VAX interactive 16-user license
QL-XULA9-BG	OpenVMS/VAX interactive 32-user license
QL-XULA9-BH	OpenVMS/VAX interactive 64-user license
QL-XULAA-BR	OpenVMS/VAX interactive 128-user license
QL-XULAB-BR	OpenVMS/VAX interactive 256-user license
QL-XULAS-6A	OpenVMS/VAX interactive unlimited-user license

Software Media and Documentation

Choose operating system media and documentation. One required for first system on site. System support requires V5.5-2.

QA-001AA-Hx	OpenVMS media with extended documentation
QA-09SAA-Hx	OpenVMS media with base documentation (VAX 4000 Model 100 systems include V5.5-2 media—TK50 and CD-ROM—and base documentation.)

OpenVMS Consolidated Software Media (CD-ROM) and Documentation

Choose as an alternative to the above OpenVMS kits. Requires RRD42 CD-ROM drive.

QA-VWJ8A-A8	OpenVMS layered product binaries on CD-ROM without hardcopy documentation
QA-VYR8A-G8	OpenVMS extended online documentation and layered product online documentation on CD-ROM; requires DECwindows Bookreader

QA-358AA-Hx	Rdb Runtime media and documentation
QA-GXXAA-Hx	POSIX media with IEEE documentation
QA-GXXAB-Hx	POSIX media without IEEE documentation

Note: x denotes media type: 5 = TK50; M = Magtape

Select the appropriate NAS software level. See description of NAS packages on page 9.2. **Note:** NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit
QL-MC2A*-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit

Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape; * denotes processor code.

Step 8—Power Cords

Select for 220/240-V use

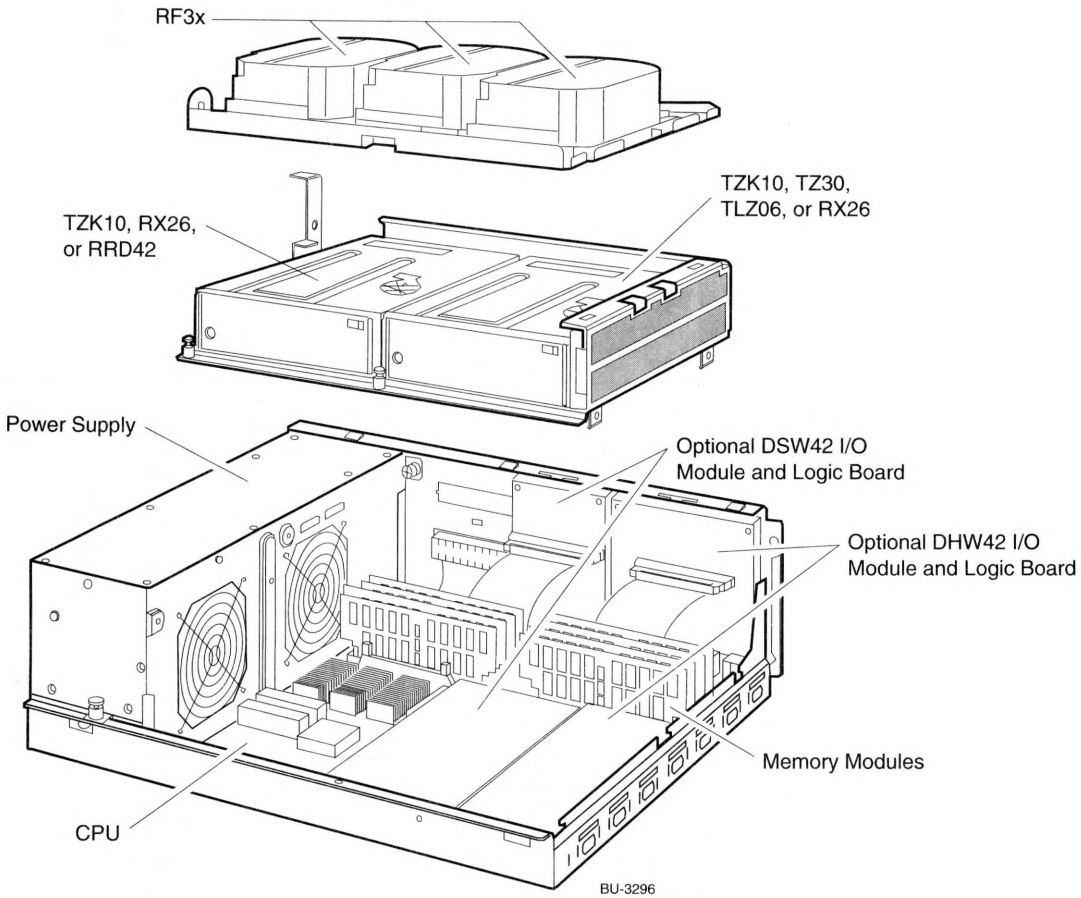
Step 8a—Power Cords for VAX 4000 Model 100 System Enclosure

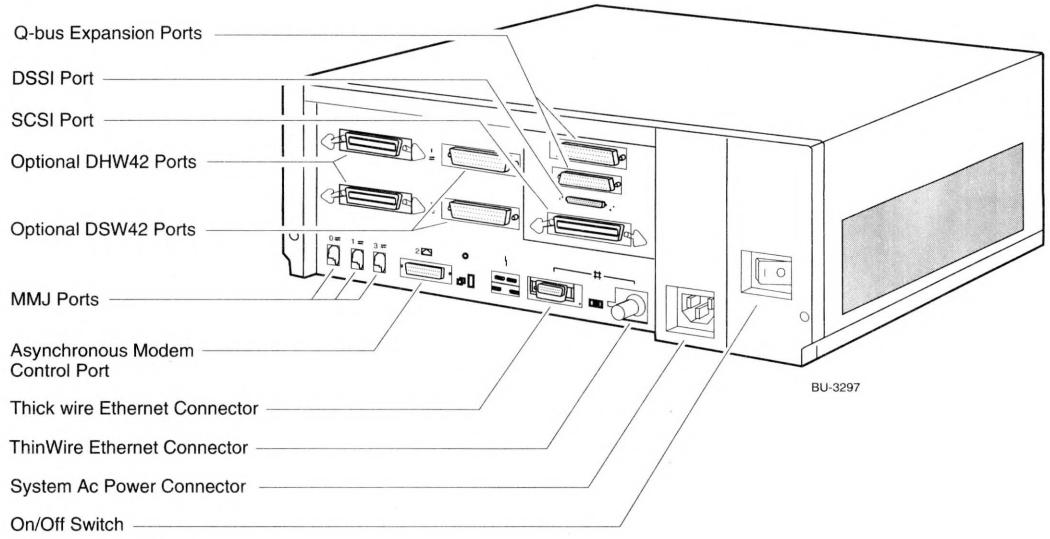
BN19A-2E	U.K., Ireland
BN19C-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19M-2E	Italy
BN19U-2E	Israel
BN19H-2E	Australia, New Zealand
BN19S-2E	India

Step 8b—Power Cords for B400X and R400X Expansion Pedestals

BN20B-2E	U.S., Canada, Japan
BN22C-2E	Australia, New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN22E-2E	U.K., Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

VAX 4000 Model 100 System Diagrams





Specifications

Physical Characteristics	
Height	14.99 cm (5.90 in.)
Width	46.38 cm (18.26 in.)
Depth	40.00 cm (15.75 in.)
Weight	18.40 kg (40.00 lb)*

Power Requirements	
Nominal voltage	120/240 Vrms
Power source phasing	Single
Nominal frequency	50–60 Hz
Voltage range	88–132 Vrms 176–264 Vrms
Line frequency tolerance	47–63 Hz
Typical running current	2.0/1.0 A
Typical power consumption	240 W

Standard Communication	
Minimum MMJ lines	Three DEC-423
Modem lines	One EIA-232
Ethernet	Thick wire and ThinWire supported on all models

Communications Options	
MMJ lines	Eight DEC-423
MMJ lines	16 DEC-423
Modem lines	Eight EIA-232
Synchronous lines	Two synchronous

Operating Environment	
Temperature (sea level)	10°–40°C (50°–90°F)
Relative humidity	10%–90% noncondensing
Maximum operating altitude	2.4 km (8,000 ft)

* Approximate weight with three disks.

Step 1—VAX 4000 Model 200 (BA215) Systems

Select system. Note that disk, tape, and diagnostics are not included with base systems and must be ordered separately.
Note: System model numbers -x2 include a 120-V power cord; -x3 require a 240-V power cord; see Step 9.

VAX/VAXserver 4000 Model 200 (BA215) systems include

- KA660 CPU with embedded DSSI adapter and 802.3/Ethernet (ThinWire/thick wire) controller
- BA215 pedestal enclosure (The BA215 enclosure is +12-V power limited. Verify planned configurations with the configuration template on page 1.76.)
  - Two dedicated slots for the CPU and memory modules and four Q-bus slots
- 8-, 16-, or 32-Mbyte ECC memory module
- 7.6-meter (25-foot) console terminal cable
- Factory-installed software*
- English-language hardware documentation (QZ-K25AB-GZ)

* Delivery of the software on a system disk is not warranted. It is provided as a convenience to the customer. Customers are encouraged to purchase the necessary media and documentation kits which include complete installation instructions. Refer to Step 8 for ordering information.

Multiuser Systems

- DECnet end-node license (with PATHWORKS for VMS)
- VMS 10-user license (with Rdb/VMS Runtime license)
- Four Q-bus slots

DV-42RT1-A2/A3	(8 Mbytes of memory)
DV-42RT1-B2/B3	(16 Mbytes of memory)
DV-42RT1-C2/C3	(32 Mbytes of memory)

Server Systems

- VMS file and application server license (with Rdb/VMS Runtime)
- DECnet full-function license (with PATHWORKS for VMS)
- VAXcluster Software license
- VMS/ULTRIX Connection license (QL-VHRA9-JB)
- Four Q-bus slots

DV-42RS1-A2/A3	(8 Mbytes of memory)
DV-42RS1-B2/B3	(16 Mbytes of memory)

Step 2—Storage and Q-bus Expansion

Select storage and Q-bus/storage devices as required. Refer to Chapter 7, *Storage Devices*, for further details on devices listed.

Step 2a—Internal Storage (System Enclosure)

Configuration Rules

- Selection of one DSSI disk (ISE) is required for factory-installed software.
- Order load/backup device if required—VAXcluster satellite members or systems being loaded over the network do not require a load device.
- Two RF3x ISEs or one RF7x ISE and one TKxx tape drive can be housed in the BA215 system enclosure. Additional ISEs may be housed in expansion pedestals.
- Single systems support seven ISEs per DSSI adapter; two-system DSSI VAXcluster configurations support six ISEs and can be connected between any pair of DSSI adapters (one adapter in each system). Three-system DSSI VAXcluster configurations support five ISEs and can be connected between any three DSSI adapters (one adapter in each system).
- Maximum two Q-bus storage adapters are supported; two KFQSAs, two KDA50s, or one of each.
- Maximum two KZQSA storage adapters.
- Maximum two KLESI (TU81E) storage controllers.

DSSI Adapter

KFQSA-SE/SG	Additional Q-bus to DSSI adapter. Uses one Q-bus slot; factory/field installed.

Integrated Storage Elements (ISEs)

RF35E-SA/SF	852-Mbyte (full-height) ISE; factory/field installed.
RF31T-SA/SF	381-Mbyte (half-height) ISE; factory/field installed.
RF72E-SA/SF	1-Gbyte (full-height) ISE; factory/field installed.
RF73E-SA/SF	2-Gbyte (full-height) ISE; factory/field installed. Requires VMS V5.5.

Step 2a—Internal Storage (System Enclosure) *(Continued)*

Tape Drives

TK70E-SA/SF	296-Mbyte embedded cartridge tape drive. Requires TQK70 controller; factory/field installed.
TQK70-SA/SF	TK70E controller; factory/field installed.
TK50E-SA/SF	95-Mbyte embedded cartridge tape drive. Requires TQK50 controller; factory/field installed.
TQK50-SA/SF	TK50E controller; factory/field installed.

SDI Disk Controller

KDA50-SE/SG	Disk controller provides connections for four external RA-disk drives; uses three Q-bus slots; factory/field installed. Refer to Chapter 7, *Storage Devices*, for RA-disk descriptions and ordering information.

Step 2b—External Storage and Q-bus Expansion

Configuration Rules

- R400X expansion pedestals can be configured with two separate DSSI buses (requires additional BC21M-09 cable).
- TF85 is supported in R400X or B400X expansion pedestals (maximum one per expansion pedestal).
- Two TKxx tape drives are supported; one in system enclosure, one in B400X.
- Four Q-bus storage adapters are supported; two KFQSAs, two KDA50s, or one of each; as well as up to two KZQSAs.
- 21 ISEs are supported with expansion pedestals (in a single system configuration).
- B400X and R400X expansion pedestals include the following:
  - Q-bus extender modules and two 2.7-meter (9-foot) cables (B400X)
  - 2.7-meter (9-foot) DSSI cable (BC21M-09)
  - 1.8-meter (6-foot) KZQSA cable (BC06P-06)
  - 3.0-meter (10-foot) power control cable (BC09F-10)
  - Universal power supply
  - 120-V power cord (220/240-V devices require a country-specific power cord; see Step 9)
- Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* for DSSI VAXcluster configuration rules.

B400X and R400X Expansion Pedestals

Refer to page 1.81 (expansion diagrams) and 1.82 for more information.

B400X-B9	Provides ten additional Q-bus slots and space for RF-series disk drives and one TKxx or TF85 tape drive; factory or field installed
H4010-AA	Cable kit required with B400X-B9
R400X-B9	Provides space for RF-series disk drives and one TF85 tape drive; factory or field installed
H4010-AA	Cable kit required with R400X-B9

ISEs for B400X and R400X Expansion Pedestals

RF31T-AA/AF	381-Mbyte ISE in full-height assembly, expandable to two ISEs; factory/field installed
RF312-AA/AF	Two 381-Mbyte ISEs in full-height assembly
RF35E-AA/AF	852-Mbyte ISE in full-height assembly, expandable to two ISEs; factory/field installed
RF352-AA/AF	Two 852-Mbyte ISEs in full-height assembly
RF72E-AA/AF	1-Gbyte ISE in full-height assembly
RF73E-AA/AF	2-Gbyte ISE in full-height assembly

Tape Drives for B400X/R400X Expansion Pedestals

TF85E-JA/JF	2.6-Gbyte embedded cartridge tape drive; factory/field installed. Also available as a tabletop option. Refer to Chapter 7, *Storage Devices*, for ordering information.
TK70E-AA/AF	296-Mbyte embedded cartridge tape drive for B400X (not supported in R400X); requires TQK70-SA controller; factory/field installed
TQK70-SA/SF	TK70E controller; factory/field installed
TK50E-AA/AF	95-Mbyte embedded cartridge tape drive. Requires TQK50 controller; factory/field installed.
TQK50-SA/SF	TK50E controller; factory/field installed.

Step 2b—External Storage and Q-bus Expansion *(Continued)*

ISE Storage Expansion Pedestals

RF72B-DA/DB*	Includes one RF72 1-Gbyte ISE and space for two additional, 2.7-meter (9-foot) DSSI cable, and documentation; factory or field installed; 120/240 V.
RF72B-CA/CB*	Same as above except includes KFQSA adapter
RF73B-DA/DB*	Includes one RF73 2-Gbyte ISE and space for two additional, 2.7-meter (9-foot) DSSI cable, and documentation; factory or field installed; 120/240 V.
RF73B-CA/CB*	Same as above except includes KFQSA adapter.

*240-V devices require a country-specific power cord. Refer to Chapter 7, *Storage Devices,* for ordering information.

ISEs for ISE Storage Expansion Pedestals

RF31T-SA/SF	381-Mbyte (half-height) ISE; factory/field installed.
RF72E-SA/SF	1-Gbyte (full-height) ISE; factory/field installed.
RF73E-SA/SF	2-Gbyte (full-height) ISE; factory/field installed. Requires VMS V5.5.

RSE Storage Expansion Pedestals

RSE Storage Expansion Pedestals include one RSE and space for one additional RSE.

RF72B-KA	Includes one RF72 RSE, 2.7-meter (9-foot) DSSI cable and documentation; factory/field installed.
RF73B-KA	Same as above except includes RF73 RSE.

Note: For 240-V use, a country-specific power cord is required. Refer to Chapter 7, *Storage Devices,* for ordering information.

RSEs for RSE Storage Expansion Pedestals

RF72-RA	1-Gbyte RSE in individual removable canister.
RF73-RA	2-Gbyte RSE in individual removable canister. Requires VMS V5.5

SDI Disk Controller

KDA50-SE/SG	Provides connections for four external RA-disk drives (except RA70/RA71); uses three Q-bus slots; factory/field installed. Refer to Chapter 7, *Storage Devices,* for RA-disk descriptions and ordering information.

KZQSA Adapter

KZQSA-SA/SF	Required for TSZ07, TLZ06, or RRD42 tabletop devices; provides connections for two storage devices (total four devices per configuration). Uses one Q-bus slot; factory/field installed.

Tape/CD-ROM Drives

TLZ06-GA*	4.0-Gbyte DAT tabletop drive; includes 1.8-meter (6-foot) cable (BC06P-06); requires KZQSA adapter.
RRD42-FB/DH*	600-Mbyte CD-ROM tabletop drive with 1.8-meter (6-foot) cable (BC06P-06); requires KZQSA adapter.
TU81E-SA/SB*	40/145-Mbyte (1600/6250 bits/inch) backup tape drive in 1-meter (40-inch) cabinet; two maximum; includes cable and KLESI controller which uses one Q-bus slot 120/240 V; factory installed.
TU81E-SF/SG*	Field installed.
TSV05-SE*	40-Mbyte (1600 bits/inch) data-interchange device in 1-meter (40-inch) cabinet; one maximum; includes cable and controller which uses one Q-bus slot. Refer to Chapter 7, *Storage Devices*, for variants other than 120-V.
TSZ07	1600/6250-bit/inch SCSI 9-track magtape. Refer to Chapter 7, *Storage Devices*, for ordering information; requires KZQSA adapter.
TF85-TA*	2.6-Gbyte cartridge tape subsystem in tabletop enclosure. Requires **CK-SF100-LP** cable kit.
SF100	DSSI Storage Array Pedestal. Refer to Chapter 7, *Storage Devices,* for ordering information.
SF2x0/300/400	DSSI DECarray Storage Subsystem. Refer to Chapter 7, *Storage Devices,* for ordering information.

* 120-V power cord included. 220/240-V devices require a country-specific power cord. Refer to Chapter 7, *Storage Devices.*

Step 3—Memory

System can be expanded to 64 Mbytes of memory. System recognizes up to four memory banks; 8-Mbyte and 16-Mbyte options require one Q-bus slot and are recognized as one bank each; 32-Mbyte options require one Q-bus slot and are recognized as two memory banks (e.g., systems configured with one 8-Mbyte, one 16-Mbyte and one 32-Mbyte—56 Mbytes of memory—require three Q-bus slots and are recognized as four memory banks).
Note: MS650-Ax memory is not supported on VAX 4000 Model 200 systems.

MS650-BB/BH	8 Mbytes of memory; factory/field installed
MS650-BA/BF	16 Mbytes of memory; factory/field installed
MS650-BC/BJ	32 Mbytes of memory; factory/field installed

Step 4—Networks and Communications

Select devices as required. Connection of system to Ethernet requires either a thick wire 15-pin AUI right-angle transceiver cable (e.g., BNE3K) or ThinWire BNC connection (e.g., BC16M). See Chapter 6, *Networks, Communications, and Cables* and the *Networks Buyer's Guide* for more information.

LAN Communications Controller

DESQA-SA/SF	802.3/Ethernet Controller (ThinWire/thick wire). Maximum two additional per system (one 802.3/Ethernet controller included with base system). Uses one Q-bus slot; factory/field installed.

Local and Wide Area Communications Servers
Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Software media and documentation and cables are also required. See descriptions in Chapter 6, *Networks, Communications, and Cables*, for ordering information.

DECserver 90L+, 90TL, 700, 250; and MUXserver 300, 310, 320, 380 Terminal and Printer Servers
Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources.

DEC WANrouter 250, 500; DEC Network Integration Server 500, 600, Proteon 4100$^+$, CNX 500; TransPATH 335, 350 Multiprotocol Routers
Select a router to cost effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products
See Chapter 6, *Networks, Communications, and Cables* and the *Networks Buyer's Guide.*

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order one video terminal (e.g., VT420) for each system unless otherwise available. Refer to Chapter 8, *Terminals and Printers,* for ordering information. A VT330/VT340/VT420 with split screen capability can be used as a shared console terminal.

Step 6—Terminals and Printers

Select terminals and printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided. Maximum two parallel printers per LPV11 controller; maximum two controllers per system which require one Q-bus slot each. Refer to Chapter 8, *Terminals and Printers,* for ordering information.

Step 7—Software

Select licenses and media and documentation as required. **Note:** Upgrade license required to support additional users beyond those included with base multiuser system—upgrade licenses must be ordered sequentially.

Software Processor Code	VAX 4000 Model 200 = **B** VAXserver 4000 Model 200 = **C**
Clusterwide License Rating	VAX 4000 Model 200 = **200** VAXserver 4000 Model 200 = **10**
QL-001AB-B2	VMS 11- to 20-user multiuser upgrade license
QL-001AB-B3	VMS 21- to 40-user multiuser upgrade license
QL-001AB-B4	VMS 41- to n-user multiuser upgrade license
QA-001AA-Hx	VMS media with extended documentation, including VAXcluster and DECnet documentation
QA-09SAA-Hx	VMS media and base documentation
QA-VWJ8A-A8	VMS and layered product binaries (CD-ROM) without hardcopy documentation
QA-VYR8A-G8	VMS extended and layered product online documentation set (CD-ROM); requires DECwindows Bookreader
QA-A93AA-Hx	PATHWORKS for VMS media and documentation
QA-358AA-Hx	VAX Rdb/VMS Runtime media and documentation
QA-VHRAA-Hx	VMS/ULTRIX Connection media and documentation. **Note:** For Server Systems only.
QL-VBRAB-AA	VAXcluster Software license for multiuser member systems only; included with server systems.
QL-AB2AB-AA	VMS Volume Shadowing media is included with VMS. This license is required to authorize its use.
	Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Select the appropriate NAS software level. See description of NAS packages on page 9.2. **Note:** The NAS packaged products do not provide hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit
QL-MC2A*-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit
QL-MC5A*-AA	NAS 400 (Network Application Support 400)
QA-MC5AA-Hx	NAS 400 media and documentation kit
	Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Step 8—Diagnostics and Documentation

Select optional diagnostics and hardware documentation.

Basic Diagnostics

QZ-K14AA-U5	On TK50 media
QZ-K32AA-U8	On CD-ROM media

Extended Diagnostics and Documentation

QX-K19AC-AA	Single-use TK50 license
QZ-K19AA-H5	Media on TK50
QY-K19AA-AW	Annual updates on TK50
QX-K32AA-AA	Single-use CD-ROM license
QZ-K32AA-H8	Media on CD-ROM
QY-K32AA-A8	Annual updates on CD-ROM
QZ-K19AA-GZ	Hardcopy extended maintenance documentation
MD-LEVAX-01	Maintenance documentation and diagnostics listings on microfiche (library and updates)

Step 8—Diagnostics and Documentation *(Continued)*

Hardware Documentation

QZ-K25AB-GZ	English-language (included with base system)
QZ-K258B-GZ	Multi-lingual (English, French, German)

Step 9—Power Cords

Select one for each 220/240-V system.

BN19B-2E	U.K./Ireland
BN19J-2E	Australia/New Zealand
BN19N-2E	Italy
BN19Y-2E	Israel
BN19T-2E	India
BN20N-2E	Canada/Japan/U.S.
BN19L-2E	Denmark
BN19F-2E	Switzerland
BN03B-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain

Select one for each 220/240-V B400X or R400X expansion enclosure.

BN20B-2E	U.S./Canada/Japan
BN22C-2E	Australia/New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN22E-2E	U.K./Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

Step 10—Environmental Products

Select environmental power products if required. Refer to Chapter 5, *VAXcluster Options/Systems Expansion, Digital's Environmental Power Products Catalog* (EB-M4442-79) and the *DECdirect* catalog for details.

Step 11—Configuring Information

Use the template that follows in conjunction with the Q-bus configuring information that follows the Rack-mountable VAX 4000 systems to validate the configuration.

SLOT	MODULE	Current (Amps) 5 Vdc	Current (Amps) 12 Vdc	Power (Watts)	Bus Loads ac	Bus Loads dc
1	KA660*	4.8	0.55	30.60	3.5	1.0
2**	MS650-Bx	***	0.0	***	0.0	0.0
3						
4						
5						
6						
Mass-storage Shelf Device						
1						
2						
3						
Total these columns:						
Must not exceed:		33.0 A	7.6 A	230 W	22.0	20.0

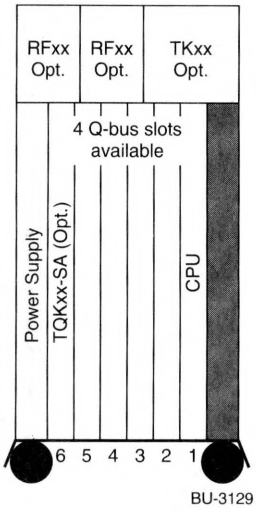
BU-3126

*Includes power requirement for H3602 I/O panel.

**Slot 2 reserved for memory only

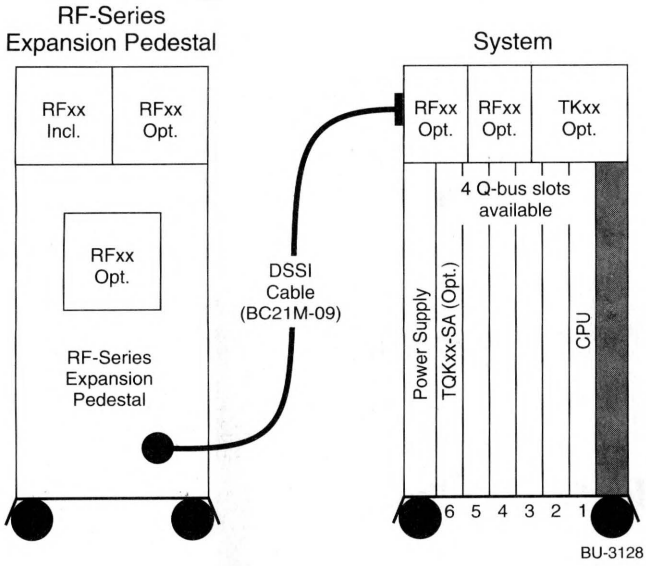
***MS650-BA: +5 Vdc = 3.5 Amps; Watts = 17.5
MS650-BB: +5 Vdc = 3.1 Amps; Watts = 15.5
MS650-BC: +5 Vdc = 2.8 Amps; Watts = 14.0

VAX/VAXserver 4000 Model 200 (BA215) System Diagrams



Note:
- The second slot can be used only for memory.

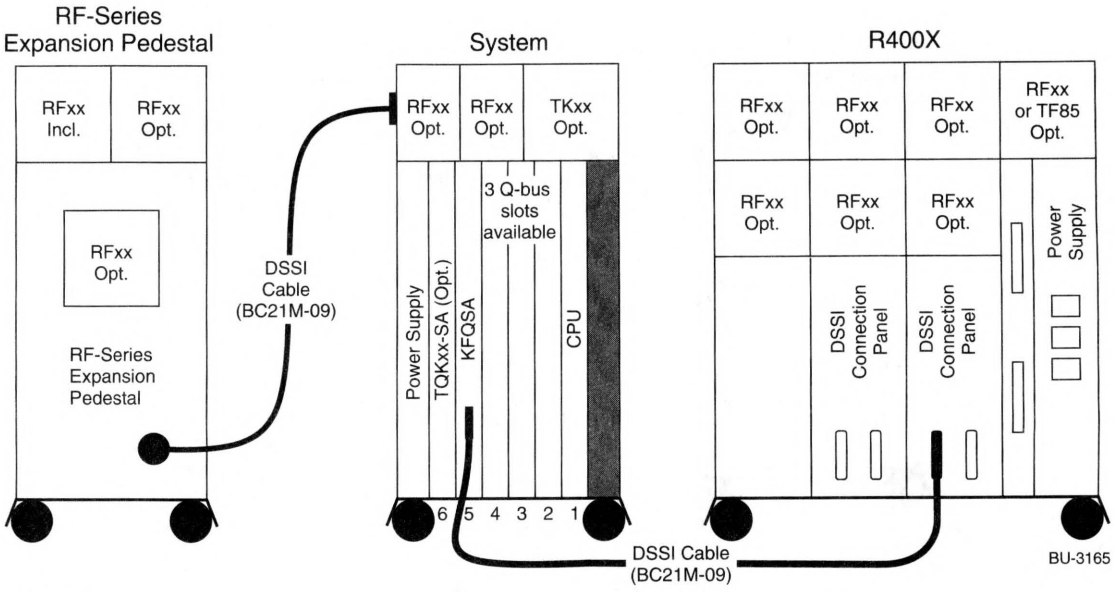
VAX/VAXserver 4000 Model 200 (BA215) Base System



Note:
- The second slot can be used only for memory.

VAX/VAXserver 4000 Model 200 (BA215) Base System with RF Series Expansion Pedestal

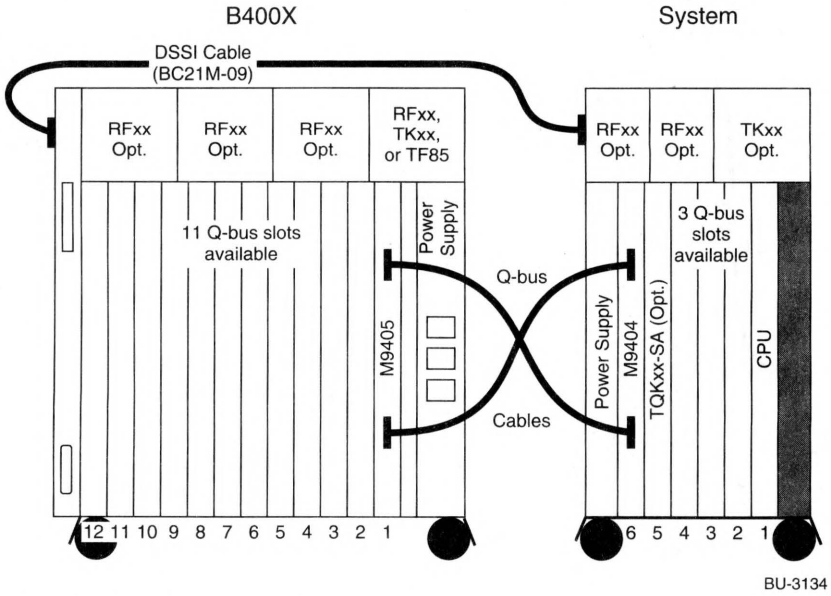
VAX/VAXserver 4000 Model 200 (BA215) Expansion Diagrams



Notes:

- RFxxB-DA includes storage expansion pedestal with one RFxx ISE and 9-ft (2.7-m) DSSI cable.
- RFxxB-CA includes RFxxB-DA items plus KFQSA as the second DSSI adapter.
- The second slot can be used only for memory.

VAX/VAXserver 4000 Model 200 (BA215) Base System with Second KFQSA Adapter and Storage Expansion



Notes:

- B400X expansion pedestal includes the Q-bus extender modules and cables, and DSSI cable (all 9-ft or 2.7-m).
- The second slot can be used only for memory.

VAX/VAXserver 4000 Model 200 (BA215) Base System with Q-bus/Storage Expansion

VAX 4000 Model 200 (BA215) Specifications

Mounting type: Pedestal

Physical Characteristics		Operating	Shipping
	Height	69.0 cm (27.0 in.)	117 cm (45.6 in.)
	Width	35.0 cm (13.6 in.)	78 cm (30.5 in.)
	Depth	45.0 cm (17.8 in.)	61 cm (23.9 in.)
	Weight	31.8 kg (70 lb)	45.5 kg (100 lb)
Clearances		**Operating**	**Service**
	Front	5.1 cm (2.0 in.)	100.0 cm (39.4 in.)
	Rear	5.1 cm (2.0 in.)	None
	Sides	5.1 cm (2.0 in.)	None
Environmental			
Temperature			
	Operating	10° to 40° C (50° to 104° F)	
	Nonoperating	–40° to 66° C (–40° to 151° F)	
	Storage (60 days)	–40° to 60° C (–40° to 151° F)	
	Rate of change	11° C per hour (20° F)	
Relative Humidity	Operating	20% to 80% noncondensing	
	Nonoperating	10% to 95% noncondensing	
	Storage	10% to 95% noncondensing	
	Storage (60 days)	10% to 95% noncondensing	
	Rate of change	25% per hour	
Maximum Wet Bulb Temperature	Operating	25° C (77° F)	
	Storage	28° C (82° F)	
Minimum Dew Point Temperature	Operating	2° C (36° F)	
Maximum Heat Dissipation	Operating	1,178 Btu/hr (345 watts)	
Air Flow and Quality	Operating	306 m^3/hr (180 ft^3/min)	
	Intake location	Front top	
	Exhaust location	All sides, bottom	
	Particle size	N/A	
	Concentration	N/A	
Altitude	Operating	2438 meters (8,000 feet)	
	Nonoperating	4877 meters (16,000 feet)	
Mechanical Shock	Operating	10 g pk for 10 ±3 MS	
	Nonoperating	40 g pk for 30 ±3 MS	
Vibration	Operating	5–22 Hz @ .01"da minimum	
		22–500 Hz @ .25g maximum	
Acoustics	Operating	5.9 bels, 41 dBA	
	Idle	5.5 bels, 41 dBA	
Electrical			
Power Requirements (ac input)	Nominal voltage (Vac)	120	240
	Voltage ranges (Vrms)	88–132	176–264
	Nominal frequency (Hz)	60	50
	Frequency range (Hz)	49–61	49–61
	Power source phasing	Single	Single
	RMS current (amps)	4.4	2.4
	Circuit breaker (amps)	7.5	7.5
Power Cord			
	Type	IEC 320 C16	
	Length	190 cm (75 in.)	
	U.S. plug	NEMA 5-15	
		Socket IEC 320 Sheet C-15	
Agency Approvals	UL 114 (office equipment)	VDE 0875 (RFI suppression)	
	UL 478 (EDP units)	Australian AS C 100	
	CSA C22.2 no.134 (office equipment)	IEC Publication 950	
	CSA C22.2 no.154 (data processing)	FCC Part 15 Docket 20780	

Step 1—VAX 4000 Model 200 (BA430) Systems

Select system. Note that disk, tape, and diagnostics are not included with base systems and must be ordered separately.
Note: Systems are shipped with a 120-V power cord. 240-V devices require a country-specific power cord; see Step 9.

VAX/VAXserver 4000 Model 200 (BA430) systems include

- KA660 CPU with embedded DSSI adapter and 802.3/Ethernet (ThinWire/thick wire) controller
- BA430 pedestal enclosure
  - Two dedicated slots for the CPU and memory modules, and ten Q-bus slots that support the same Q-bus type options as VAX 4000 Model 300 systems
  - Universal power supply that automatically adjusts to 90–128 Vac or 190–256 Vac
- 16- or 32-Mbyte ECC memory module
- 7.6-meter (25-foot) console terminal cable
- 120-V power cord (220/240-V devices require a country-specific power cord; see Step 9)
- Factory-installed software*
- One-year product warranty (standard warranty recommended)
- English-language hardware documentation (QZ-K25AA-GZ)

* Delivery of the software on a system disk is not warranted. It is provided as a convenience to the customer. Customers are encouraged to purchase the necessary media and documentation which include complete installation instructions. Refer to Step 7 for ordering information.

Multiuser System

- VMS 1- to 20-user license (with Rdb/VMS Runtime license)
- DECnet end-node license (with PATHWORKS for VMS)
- Ten Q-bus slots

DV-42HT1-A9 (16 Mbytes of memory)
DV-42HT1-B9 (32 Mbytes of memory)

Two-System DSSI VAXcluster Multiuser System

- Two VMS unlimited-user licenses (with Rdb/VMS Runtime license)
- Two VAXcluster Software licenses
- DECnet full-function license (with PATHWORKS for VMS)
- DECnet end-node license (with PATHWORKS for VMS)
- BC21M-09 DSSI bus cable
- *DSSI VAXcluster Installation and Troubleshooting Guide* (EK-410AA-MG)

DV-42HT2-A9

Server System

- VMS file and application server license (with Rdb/VMS Runtime)
- VAXcluster Software license
- DECnet full-function license (with PATHWORKS for VMS)
- VMS/ULTRIX Connection license
- Ten Q-bus slots

DV-42HS1-A9

Two-System DSSI VAXcluster Server System

- Two VMS file and application server licenses (with Rdb/VMS Runtime license)
- Two VAXcluster Software licenses
- DECnet full-function license (with PATHWORKS for VMS)
- DECnet end-node license (with PATHWORKS for VMS)
- VMS/ULTRIX Connection licenses
- BC21M-09 DSSI bus cable
- *DSSI VAXcluster Installation and Troubleshooting Guide* (EK-410AA-MG)

DV-42HS2-A9

Note: Options ordered with two-system DSSI VAXcluster systems are configured evenly between the systems unless specified differently on the order.

Step 2—Storage and Q-bus Expansion

Select storage and Q-bus/storage devices as required. Refer to Chapter 7, *Storage Devices,* for further details on devices listed.

Step 2a—Internal Storage (System Enclosure)

Configuration Rules

- Selection of one DSSI disk (ISE) is required for factory-installed software.
- Order load device if necessary—VAXcluster satellite members or systems being loaded over the network do not require a load device.
- System enclosures support storage options in the following configurations:
  - Up to four RF7x ISEs
  - Up to three RF7x ISEs and one TKxx or TF85 tape drive
  - Up to seven RF312/RF352 ISEs
  - Up to six RF312/RF352 ISEs and one TKxx or TF85 tape drive

  Additional ISEs are housed in expansion pedestals.
- One TF85 per enclosure (BA430, B400X, R400X).
- Two TKxx tape drives are supported: one in the system enclosure and one in a B400X expansion pedestal.
- Maximum two Q-bus storage adapters are supported; two KFQSAs, two KDA50s, or one of each.
- Maximum two KZQSA storage adapters.
- Maximum two KLESI (TU81E) storage controllers.

DSSI Adapter

KFQSA-SE/SG	Additional Q-bus-to-DSSI adapter. Uses one Q-bus slot; factory/field installed.

Integrated Storage Elements (ISEs)

RF31T-AA/AF	381-Mbyte ISE in full-height assembly, expandable to two ISEs; factory/field installed
RF312-AA/AF	Two 381-Mbyte ISEs in full-height assembly
RF35E-AA/AF	852-Mbyte ISE in full-height assembly, expandable to two ISEs; factory/field installed
RF352-AA/AF	Two 852-Mbyte ISEs in full-height assembly
RF72E-AA/AF	1-Gbyte ISE in full-height assembly
RF73E-AA/AF	2-Gbyte ISE in full-height assembly

Tape Drives

TF85E-JA/JF	2.6-Gbyte embedded cartridge tape drive, supported by the embedded DSSI adapter; factory/field installed.
TK70E-AA/AF	296-Mbyte embedded cartridge tape drive. Requires TQK70 controller; factory/field installed.
TQK70-SA/SF	TK70E controller; factory/field installed.
TK50E-AA/AF	95-Mbyte embedded cartridge tape drive. Requires TQK50 controller; factory/field installed.
TQK50-SA/SF	TK50E controller; factory/field installed.

SDI Disk Controller

KDA50-SE/SG	KDA50 disk controller provides connections for four external RA-disk drives; uses three Q-bus slots; factory/field installed. Refer to Chapter 7, *Storage Devices,* for RA-disk descriptions and ordering information.

Step 2b—External Storage and Q-bus Expansion

Configuration Rules

- 21 ISEs are supported with expansion pedestals (in a single system configuration).
- R400X expansion pedestals can be configured with two separate DSSI buses (requires additional BC21M-09 cable).
- Single systems support seven ISEs per DSSI adapter; two-system DSSI VAXcluster configurations support six DSSI ISEs and can be connected between any pair of DSSI adapters (one adapter in each system); three-system DSSI VAXcluster configurations support five ISEs and can be connected between any three DSSI adapters (one adapter in each system).
- Four Q-bus storage adapters are supported; two KFQSAs, two KDA50s, or one of each; as well as up to two KZQSAs.
- B400X and R400X expansion pedestal include the following:
  - Q-bus extender modules and two 2.7-meter (9-foot) cables (B400X)
  - 2.7 meter (9-foot) DSSI cable (BC21M-09)
  - 1.8-meter (6-foot) KZQSA cable (BC06P-06)
  - Universal power supply
  - 3.0-meter (10-foot) power control cable (BC09F-10)
  - 120-V power cord (220/240-V devices require a country-specific power cord; see Step 9)
- Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* for DSSI VAXcluster configuration rules.

B400X and R400X Expansion Pedestals

Refer to page 1.81 (expansion diagrams) and 1.82 for more information.

B400X-B9	Provides ten additional Q-bus slots and space for RF series disk drives and one TK70 or TF85 tape drive. Factory or field installed.
R400X-B9	Provides space for RF series disk drives and one TF85 tape drive. Factory or field installed.

Note: B400X/R400X use the same ISEs, DAT drives, and tape drives as listed in Step 2a with the exception of the TKxx; TKxx tape drives are not supported in R400X expansion pedestal.

ISE Storage Expansion Pedestals

RF72B-DA/DB*	Includes one RF72 1-Gbyte ISE and space for two additional, 2.7-meter (9-foot) DSSI cable, and documentation; factory or field installed; 120/240 V.
RF72B-CA/CB*	Same as above except includes KFQSA adapter
RF73B-DA/DB*	Includes one RF73 2-Gbyte ISE and space for two additional, 2.7-meter (9-foot) DSSI cable, and documentation; factory or field installed; 120/240 V.
RF73B-CA/CB*	Same as above except includes KFQSA adapter.

*240-V devices require a country-specific power cord. Refer to Chapter 7, *Storage Devices,* for ordering information.

ISEs for ISE Storage Expansion Pedestals

RF31T-SA/SF	381-Mbyte (half-height) ISE; factory/field installed.
RF72E-SA/SF	1-Gbyte (full-height) ISE; factory/field installed.
RF73E-SA/SF	2-Gbyte (full-height) ISE; factory/field installed. Requires VMS V5.5.

RSE Storage Expansion Pedestals

RSE storage expansion pedestals include one RSE and space for one additional RSE.

RF72B-KA	Includes one RF72 RSE, 2.7-meter (9-foot) DSSI cable, and documentation; factory/field installed
RF73B-KA	Same as above except includes RF73 RSE

Note: For 240-V use, a country-specific power cord is required. Refer to Chapter 7, *Storage Devices,* for ordering information.

RSEs for RSE Storage Expansion Pedestals

RF72-RA	1-Gbyte RSE in individual removable canister.
RF73-RA	2-Gbyte RSE in individual removable canister. Requires VMS V5.5.

SDI Disk Controller

KDA50-SE/SG	Provides connections for four external RA-disk drives (except RA70/RA71); uses three Q-bus slots; factory/field installed. Refer to Chapter 7, *Storage Devices,* for RA-disk descriptions and ordering information.

KZQSA Adapter

KZQSA-SA/SF	Required for TSZ07, TLZ06, or RRD42 tabletop devices; provides connections for two storage devices (total four devices per configuration). Uses one Q-bus slot; factory/field installed.

Step 2b—External Storage and Q-bus Expansion *(Continued)*

Tape/CD-ROM Drives

TLZ06-GA*	4.0-Gbyte tabletop DAT drive; requires KZQSA adapter. Includes 1.8-meter (6-foot) cable (BC06P-06); requires KZQSA-SA.
RRD42-FB/DH*	600-Mbyte tabletop CD-ROM drive with 1.8-meter (6-foot) cable (BC06P-06); requires KZQSA adapter.
TU81E-SA/SB*	40/145-Mbyte (1600/6250 bits/inch) backup tape drive in 1-meter (40-inch) cabinet; two maximum; includes cable and KLESI controller which uses one Q-bus slot; factory installed.
TU81E-SF/SG*	Field installed.
TSV05-SE*	40-Mbyte (1600 bits/inch) data-interchange device in 1-meter (40-inch) cabinet; one maximum; includes cable and controller which uses one Q-bus slot. Refer to Chapter 7, *Storage Devices,* for variants other than 120-V.
TSZ07	1600/6250-bit/inch 9-track magtape. Refer to Chapter 7 for ordering information.
TF85-TA*	2.6-Gbyte cartridge tape subsystem in tabletop enclosure. Requires **CK-SF100-LP** cable kit.
SF100	DSSI Storage Array Pedestal. Refer to Chapter 7, *Storage Devices,* for ordering information.
SF2x0/300/400	DSSI DECarray Storage Subsystem. Refer to Chapter 7, *Storage Devices,* for ordering information.

* 120-V power cord included. 220/240-V devices require a country-specific power cord. Refer to Chapter 7, *Storage Devices.*

Step 3—Memory

System can be expanded to 64 Mbytes of memory. System recognizes up to four memory banks; 8 Mbyte and 16-Mbyte options require one Q-bus slot and are recognized as one bank each; 32-Mbyte options require one Q-bus slot and are recognized as two memory banks (e.g., systems configured with one 8-Mbyte, one 16-Mbyte and one 32-Mbyte—56 Mbytes of memory—require three Q-bus slots and are recognized as four memory banks).
Note: MS650-Ax memory is not supported on VAX 4000 Model 200 systems.

MS650-BB/BH	8 Mbytes of memory; factory/field installed
MS650-BA/BF	16 Mbytes of memory; factory/field installed
MS650-BC/BJ	32 Mbytes of memory; factory/field installed

Step 4—Networks and Communications

Select devices as required. Connection of system to Ethernet requires either a thick wire 15-pin AUI right-angle transceiver cable (e.g., BNE3K) or ThinWire BNC connection (e.g., BC16M). See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for more information.

LAN Communications Controller

DESQA-SA/SF	DESQA 802.3/Ethernet Controller (ThinWire/thick wire). Maximum two additional per system (one 802.3/Ethernet controller included with base system). Uses one Q-bus slot; factory/field installed.

Local and Wide Area Communications Servers
Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Software media and documentation and cables are also required. See descriptions in Chapter 6, *Networks, Communications, and Cables*, for ordering information.

DECserver 90L+, 700, 250, and MUXserver 300, 310, 380 Terminal and Printer Servers
Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources.

DEC WANrouter 150, 250, 500, and TransPATH 335, 350 Multiprotocol Routers
Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products
See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide.*

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., VT420) for each system unless otherwise available. Refer to Chapter 8, *Terminals and Printers,* for ordering information. A VT330/VT340/VT420 with split screen capability can be used as a shared console terminal.

Step 6—Terminals and Printers

Select terminals and printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided. Maximum two parallel printers per LPV11 controller; maximum two controllers per system which require one Q-bus slot each. Refer to Chapter 8, *Terminals and Printers,* for ordering information.

Step 7—Software

Select licenses and media and documentation as required. **Note:** Upgrade licenses required to support additional users beyond those included with base multiuser system—upgrade licenses must be order sequentially.

Software Processor Code	VAX 4000 Model 200 = **B** VAXserver 4000 Model 200 = **C**
Clusterwide License Rating	VAX 4000 Model 200 = **200** VAXserver 4000 Model 200 = **10**
QL-001AB-B3	VMS 21- to 40-user multiuser upgrade license
QL-001AB-B4	VMS 41- to n-user multiuser upgrade license
QA-001AA-Hx	VMS media with extended documentation kit, including VAXcluster and DECnet documentation
QA-09SAA-Hx	VMS media and base documentation
QA-VWJ8A-A8	VMS and layered product binaries (CD-ROM) without hardcopy documentation
QA-VYR8A-G8	VMS extended and layered product online documentation set (CD-ROM); requires DECwindows Bookreader
QA-A93AA-Hx	PATHWORKS for VMS media and documentation
QA-358AA-Hx	VAX Rdb/VMS Runtime media and documentation
QA-VHRAA-Hx	VMS/ULTRIX Connection media and documentation **Note:** For server systems only.
QL-VBRAB-AA	VAXcluster Software license for multiuser member systems only; included with Server systems.
QL-AB2AB-AA	VMS Volume Shadowing media is included with VMS. This license is required to authorize its use.
	Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape; * denotes porcessor code

Select the appropriate NAS software level. See description of NAS packages on page 9.2. **Note:** The NAS packaged products do not provide hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit
QL-MC2A*-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit
QL-MC5A*-AA	NAS 400 (Network Application Support 400)
QA-MC5AA-Hx	NAS 400 media and documentation kit
	Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Step 8—Diagnostics and Documentation

Select optional diagnostics and hardware documentation.

Basic Diagnostics

QZ-K14AA-U5	On TK50 media
QZ-K32AA-U8	On CD-ROM media

Extended Diagnostics and Documentation

QX-K19AC-AA	Single-use TK50 license
QZ-K19AA-H5	Media on TK50
QY-K19AA-AW	Annual updates on TK50

Step 8—Diagnostics and Documentation *(Continued)*

QX-K32AA-AA	Single-use CD-ROM license
QZ-K32AA-H8	Media on CD-ROM
QY-K32AA-A8	Annual updates on CD-ROM
QZ-K19AA-GZ	Hardcopy extended maintenance documentation
MD-LEVAX-01	Maintenance documentation and diagnostics listings on microfiche (library and updates)

Hardware Documentation

QZ-K25AB-GZ	English-language (included with base system)
QZ-K258B-GZ	Multi-lingual (English, French, German)

Step 9—Power Cords

Select one for each 220/240-V system or expansion pedestal.

BN20B-2E	U.S./Canada/Japan
BN22C-2E	Australia/New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN22E-2E	U.K./Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

Step 10—Environmental Products

Select environmental power products if required. Refer to Chapter 5, *VAXcluster Options/Systems Expansion*, *Digital's Environmental Power Products Catalog* (EB-M4442-79), and the *DECdirect* catalog for details.

Step 11—Configuring Information

Use the template that follows in conjunction with the configuring information that follows the Rack-mountable VAX 4000 systems to validate the configuration.

SLOT	MODULE	Current (Amps) +5 Vdc	+12 Vdc	−12 Vdc	Power (Watts)	Bus Loads ac	dc
0	M9715	0.10	3.0	0.0	12.5	0.0	0.0
1	KA660*	4.8	0.55	0.0	30.60	3.5	1.0
2	MS650-Bx	**	0.0	0.0	**	0.0	0.0
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
Mass-storage Shelf Device							
1							
2							
3							
4							
Total these columns:							
Must not exceed:		60.0	18.0	N/A	584	35.0	20.0

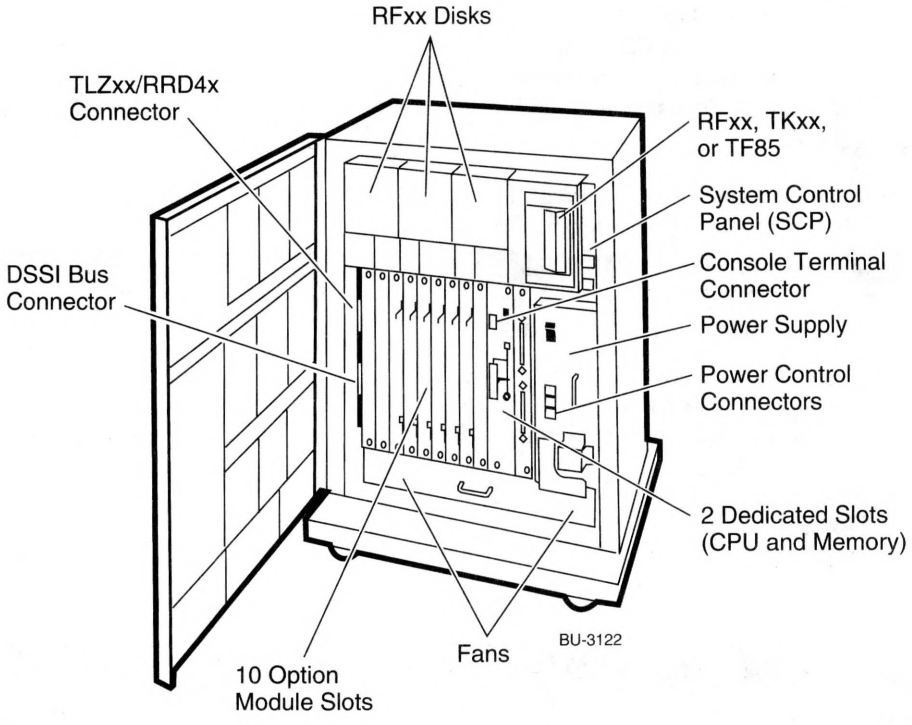
*Includes power requirements for H3602 I/O panel

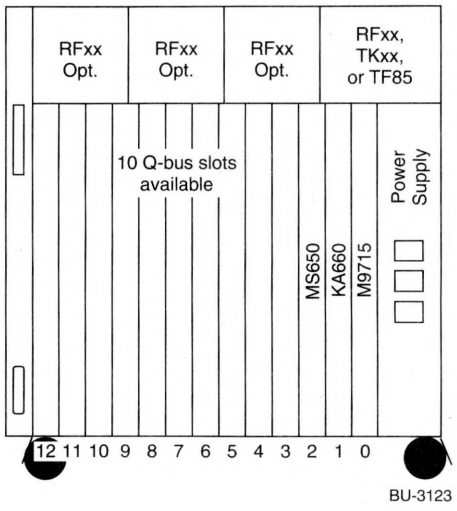
**MS650-BA (Included with base system): +5 Vdc = 3.5; Watts = 17.5
MS650-BB: +5 Vdc = 3.1; Watts = 15.5
MS650-BC: +5 Vdc + 2.8; Watts = 14.0

BU-3121

Note: VAX 4000 Model 200 (BA430) specifications follow VAX 4000 Models 400, 500, and 600 ordering menu.

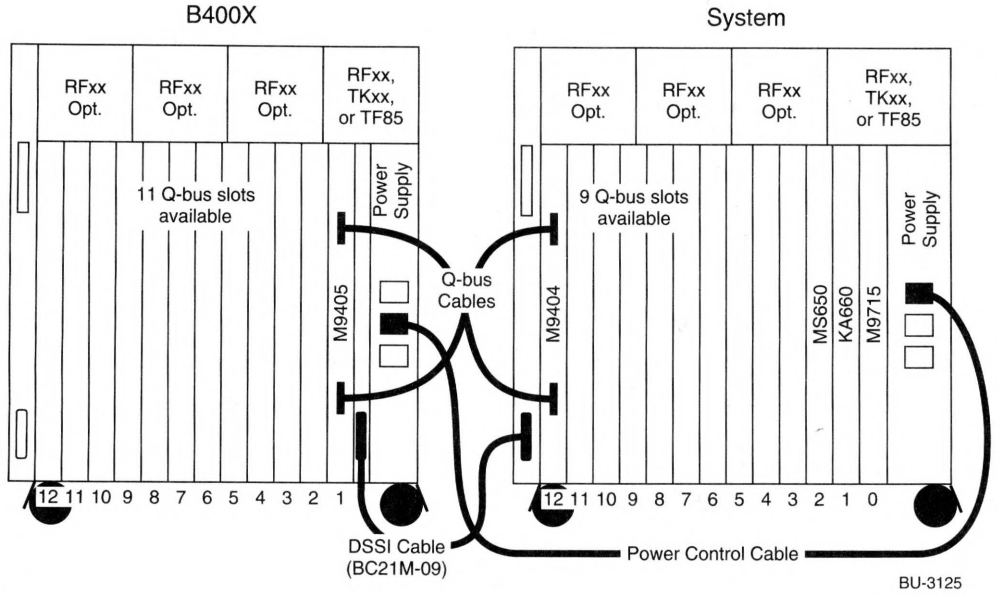
VAX/VAXserver 4000 Model 200 (BA430) System Diagrams





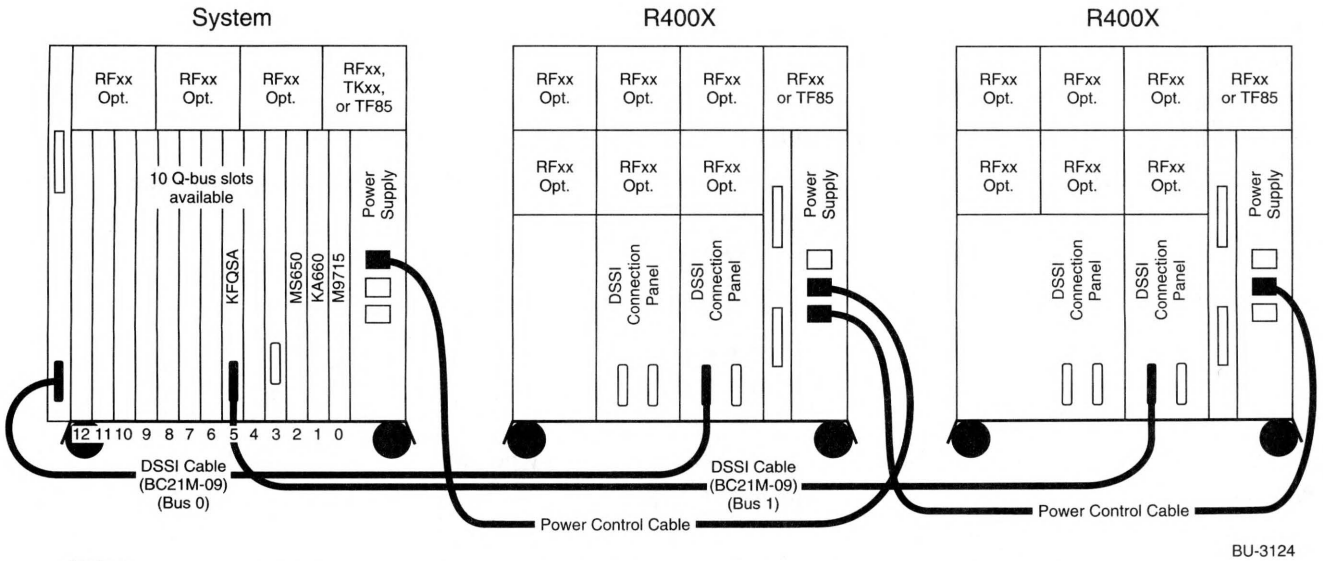
VAX 4000 Model 200 (BA430) Base System

VAX 4000 Model 200 (BA430) System Expansion Diagrams



Notes:

- A power control bus cable connects the VAX 4000 Model 200 (BA430) system to the B400X expander. This power control bus cable permits the power to be turned on and off for the entire expanded system with the on/off switch on the VAX 4000 model 200 (BA430) power supply.
- B400X expander includes a 9-foot (2.7-meter) DSSI cable.



Notes:

- Two power control bus cables connect the VAX 4000 Model 200 (BA430) system to the two R400X expanders. These power control bus cables permit the power to be turned on and off for the entire expanded system with the on/off switch on the VAX 4000 Model 200 (BA430) power supply.
- R400X expander includes a 9-foot (2.7-meter) DSSI cable.

Step 1—VAX 4000 Model 300 Systems

Select system. Note that disk, tape, and diagnostics are not included in base systems and must be ordered separately.

VAX/VAXserver 4000 Model 300 systems include

- CPU with two embedded DSSI adapters, and one 802.3/Ethernet (ThinWire/thick wire) controller
- BA440 system pedestal enclosure
  - Five dedicated slots for the system and memory modules, and seven available Q-bus slots
  - Universal power supply that automatically adjusts to 90–128 Vac or 190–256 Vac
- 7.6-meter (25-foot) console terminal cable
- 120-V power cord (220-V/240-V devices require a country-specific power cord; see Step 9)
- *DSSI VAXcluster Installation and Troubleshooting Guide* (EK-410AA-MG)
- English-language hardware documentation (QZ-K04AA-GZ)
- Factory-installed software*
- One full-year product warranty (standard warranty recommended)

* Delivery of the software on a systems disk is not warrantied. It is provided as a convenience to the customer. Customers are encouraged to buy the necessary media and documentation, which include complete installation instructions. See Step 7.

Multiuser Systems

- VMS 1- to 20-user license (with Rdb/VMS Runtime license)
- DECnet end-node license (with PATHWORKS for VMS)

DV-43JTB-A9 VAX 4000 Model 300 with 32 Mbytes of memory

- VMS 1- to 40-user license (with Rdb/VMS Runtime license)
- DECnet end-node license (with PATHWORKS for VMS)

DV-43JT1-A9 VAX 4000 Model 300 with 32 Mbytes of memory
DV-43JT1-B9 VAX 4000 Model 300 with 64 Mbytes of memory

Two-System DSSI VAXcluster Multiuser Systems

- Two VMS unlimited-user licenses (with Rdb/VMS Runtime license)
- Two VAXcluster Software licenses
- DECnet full-function license (with PATHWORKS for VMS)
- DECnet end-node license (with PATHWORKS for VMS)
- Two BC21M-09 DSSI bus cable

DV-43JT2-A9 VAX 4000 Model 300 with 32 Mbytes of memory per system
DV-43JT2-B9 VAX 4000 Model 300 with 64 Mbytes of memory per system

Note: Two-system DSSI VAXcluster systems have a total of 14 available Q-bus slots. Options are configured evenly between the two systems, unless specified differently on the order.

Three-System DSSI VAXcluster Multiuser Packaged System

- Three VMS unlimited-user licenses (with Rdb/VMS Runtime license)
- Three VAXcluster Software licenses
- Two DECnet end-node licenses (with PATHWORKS for VMS)
- DECnet full-function license (with PATHWORKS for VMS)
- Four BC21M-09 DSSI bus cables

DV-43JT3-B9 VAX 4000 Model 300 with 64 Mbytes of memory per system

Note: Options ordered with two- or three-system DSSI VAXcluster systems are configured evenly among the systems unless specified differently on the order.

Server Systems

- VMS file and application server license (with Rdb/VMS Runtime license)
- VAXcluster Software license
- DECnet full-function license (with PATHWORKS for VMS)
- VMS/ULTRIX Connection license

DV-43JS1-A9 VAXserver 4000 Model 300 with 32 Mbytes of memory per system
DV-43JS1-B9 VAXserver 4000 Model 300 with 64 Mbytes of memory per system

Step 1—Systems *(Continued)*

Two-System DSSI VAXcluster Server Systems

- Two VMS file and application server licenses (with Rdb/VMS Runtime license)
- Two VAXcluster Software licenses
- DECnet full-function license (with PATHWORKS for VMS)
- DECnet end-node license (with PATHWORKS for VMS)
- Two VMS/ULTRIX Connection licenses
- Two BC21M-09 DSSI bus cables

DV-43JS2-A9	VAXserver 4000 Model 300 with 32 Mbytes of memory per system
DV-43JS2-B9	VAXserver 4000 Model 300 with 64 Mbytes of memory per system

Three-System DSSI VAXcluster Server System

- Three VMS files and application server licenses (with Rdb/VMS Runtime licenses)
- Three VAXcluster Software licenses
- Three VMS/ULTRIX Connection licenses
- Two DECnet end-node licenses (with PATHWORKS for VMS)
- DECnet full-function license (with PATHWORKS for VMS)
- Four BC21M-09 DSSI bus cables

DV-43JS3-A9	VAXserver 4000 Model 300 with 32 Mbytes of memory per system

Note: Options ordered with two- or three-system DSSI VAXcluster systems are configured evenly among the systems unless specified differently on the order.

Step 2—Storage and Q-bus Expansion

Select storage and Q-bus/storage devices as required. Refer to Chapter 7, *Storage Devices,* for further details on devices listed.

Step 2a—Internal Storage (System Enclosure)

Configuration Rules

- Selection of one DSSI disk (ISE) is required for factory-installed software.
- Order load device if necessary—VAXcluster satellite members or systems being loaded over the network do not require a load device.
- One TF85 per enclosure (BA440, R400X, B400X; maximum two TF85s per DSSI adapter).
- System enclosures support storage options in the following configurations:
  - Up to four RF7x ISEs
  - Up to three RF7x ISEs and one TKxx or TF85 tape drive
  - Up to seven RF312/RF352 ISEs
  - Up to six RF312/RF352 ISEs and one TKxx or TF85 tape drive

  Additional ISEs are housed in expansion pedestals.
- Refer to Chapter 5, *VAXcluster Options/System Expansion* for DSSI VAXcluster configuration rules.
- Single systems support seven ISEs per DSSI adapter; two-system DSSI VAXcluster configurations support six ISEs and can be connected between any pair of DSSI adapters (one adapter in each system); three-system DSSI VAXcluster configurations support five ISEs and can be connected between any three DSSI adapters (one adapter in each system).
- Maximum two Q-bus storage adapters are supported; two KFQSAs, two KDA50s, or one of each.
- Maximum two KZQSA storage adapters.
- Maximum two KLESI (TU81E) storage controllers.

DSSI Adapter

KFQSA-SE/SG	Additional Q-bus-to-DSSI adapter. Uses one Q-bus slot; factory/field installed.

Step 2a—Internal Storage (System Enclosure) *(Continued)*

Integrated Storage Elements (ISEs)

RF31T-AA/AF	381-Mbyte (half-height) ISE; factory/field installed
RF312-AA/AF	Two 381-Mbyte (762-Mbyte) RSEs; factory/field installed
RF35E-AA/AF	852-Mbyte (full-height) ISE; factory/field installed
RF352-AA/AF	Two 852-Mbyte (1.7-Gbyte) ISEs; factory/field installed
RF72E-AA/AF	1-Gbyte (full-height) ISE; factory/field installed
RF73E-AA/AF	2-Gbyte (full-height) ISE; factory/field installed

Tape Drives

TF85E-JA/JF	2.6-Gbyte embedded cartridge tape drive, supported by the embedded DSSI adapter; factory/field installed.
TK70E-AA/AF	296-Mbyte embedded cartridge tape drive. Requires TQK70-SA/SF controller; factory/field installed.
TQK70-SA/SF	TK70E controller; factory/field installed.

Step 2b—External Storage and Q-bus Expansion

- R400X expansion pedestals can be configured with two separate DSSI buses (requires additional BC21M-09 cable).
- 28 ISEs are supported with R400X expansion pedestals (in a single system configuration).
- Two TKxx tape drives are supported, one in system enclosure, one in B400X.
- Four Q-bus storage adapters are supported; two KFQSAs, two KDA50s, or one of each; as well as up to two KZQSAs.
- B400X/R400X expansion pedestals include the following:
  - Q-bus extender modules and two 2.7-meter (9-foot) cables (B400X)
  - 2.7-meter (9-foot) DSSI cable (BC21M-09)
  - 1.8-meter (6-foot) KZQSA cable (BC06P-06)
  - 3.0-meter (10-foot) power control cable (BC09F-10)
  - Universal power supply
  - 120-V power cord; 220/240-V devices require a country-specific power cord; see R400X/B400X descriptions that follow this ordering menu
- Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* for DSSI VAXcluster configuration rules.

B400X and R400X Expansion Pedestals

Refer to page 1.81 (expansion diagrams) and 1.82 for more information.

B400X-B9	Provides ten additional Q-bus slots and space for RF-series disk drives and one TKxx or TF85 tape drive. Factory or field installed.
R400X-B9	Provides space for RF-series disk drives and one TF85 tape drive. Factory or field installed.

Note: B400X/R400X use the same ISEs, DAT drive, and tape drives as listed in Step 2a with the exception of the TK70; TKxx tape drives are not supported in R400X expansion pedestal.

RSE Storage Expansion Pedestals

RSE storage expansion pedestals include one RSE and space for one additional RSE.

RF72B-KA	Includes RF72 RSE, 2.7-meter (9-foot) DSSI cable, and documentation, factory/field installed.
RF73B-KA	Same as above except includes RF73 RSE.

Note: For 240-V use, a country-specific power cord is required. Refer to Chapter 7, *Storage Devices,* for ordering information.

RSEs for RSE Storage Expansion Pedestals

RF72-RA	1-Gbyte RSE in individual removable canister.
RF73-RA	2-Gbyte RSE in individual removable canister. Requires VMS V5.5

SDI Disk Controller

KDA50-SE/SG	Provides connections for four external RA-disk drives (except RA70/RA71); uses three Q-bus slots; factory/field installed. Refer to Chapter 7, *Storage Devices,* for RA-disk descriptions and ordering information.

KZQSA Disk Adapter

KZQSA-SA/SF	Required for TSZ07, TLZ06, or RRD42 tabletop devices, provides connections for two storage devices (total four devices per configuration). Uses one Q-bus slot; factory/field installed.

Step 2b—External Storage and Q-bus Expansion *(Continued)*

Tape/CD-ROM Drives

TLZ06-GA*	4.0-Gbyte tabletop DAT drive; includes 1.8-meter (6-foot) cable (BC06P-06). Requires KZQSA-SA adapter.
RRD42-FB/DH*	600-Mbyte tabletop CD-ROM drive; includes 1.8-meter (6-foot) cable (BC06P-06). Requires KZQSA-SA adapter.
TU81E-SA/SB*	40/145-Mbyte (1600/6250 bits/inch) backup tape drive in 1-meter (40-inch) cabinet; two maximum; includes cable and KLESI controller which uses one Q-bus slot; 120/240-V factory installed.
TU81E-SF/SG*	120/240-V field installed.
TSV05-SE*	40-Mbyte (1600 bits/inch) data-interchange device in 1-meter (40-inch) cabinet; one maximum; includes cable and controller which uses one Q-bus slot. Refer to Chapter 7, *Storage Devices,* for models other than 120-V.
TSZ07	1600/6250-bit/inch 9-track magtape. Refer to Chapter 7, *Storage Devices*, for ordering information.
TF85-TA*	2.6-Gbyte cartridge tape subsystem in tabletop enclosure. Requires **CK-SF100-LP** cable kit.
SF100	DSSI Storage Array Pedestal. Refer to Chapter 7, *Storage Devices,* for ordering information.
SF2x0/300/400	DSSI DECarray Storage Subsystem. Refer to Chapter 7, *Storage Devices,* for ordering information.

* 120-V power cord included. 220/240-V devices require a country-specific power cord, refer to Chapter 7, *Storage Devices.*

Step 3—Memory

Select a maximum of three additional memory modules. VAX 4000 Model 300 systems can be expanded to 256 Mbytes of memory per system.

MS670-BA	32 Mbytes of memory, uses one dedicated memory slot; factory or field installed.
MS670-CA	64 Mbytes of memory, uses one dedicated memory slot; factory or field installed.

Step 4—Networks and Communications

Select devices as required. Connection of system to Ethernet requires either a thick wire 15-pin AUI right-angle transceiver cable (e.g., BNE3K) or ThinWire BNC connection (e.g., BC16M). See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for more information.

LAN Communications Controller

DESQA-SA/SF	802.3/Ethernet Controller (ThinWire/thick wire). Maximum two additional per system (one 802.3/Ethernet controller included with base system). Uses one Q-bus slot; factory/field installed.

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Software media and documentation and cables are also required. See descriptions in Chapter 6, *Networks, Communications, and Cables*, for ordering information.

DECserver 90L+, 700, 250, and MUXserver 300, 310, 380 Terminal and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources.

DEC WANrouter 150, 250, 500, and TransPATH 335, 350 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products

See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide.*

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., the VT420) for each system unless otherwise available. See Chapter 8, *Terminals and Printers,* for ordering information. A VT330/VT340/VT420 with split screen capability can be used as a shared console terminal.

Step 6—Terminals and Printers

Select terminals and printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided. Maximum two parallel printers per LPV11 controller; maximum two controllers per system which require one Q-bus slot each. See Chapter 8, *Terminals and Printers,* for ordering information.

Step 7—Software

Upgrade license required to support additional users beyond those included in base systems.

Software Processor Code	VAX 4000 Model 300 = **2** VAXserver 4000 Model 300 = **C**
Clusterwide License Rating	VAX 4000 Model 300 = **300** VAXserver 4000 Model 300 = **10**
QL-001A2-B4	VMS 41- to unlimited-user multiuser upgrade license.
QA-001AA-Hx	VMS media and extended documentation, including VAXcluster and DECnet documentation.
QA-09SAA-Hx	VMS media and base documentation.
QA-VWJ8A-A8	VMS and layered product binaries (CD-ROM) without hardcopy documentation.
QA-VWJ8B-H8	VMS and layered product binaries (CD-ROM) and VMS hardcopy base documentation.
QA-VWJ8A-H8	VMS and layered product binaries (CD-ROM) and VMS extended hardcopy documentation.
QA-VYR8A-G8	VMS extended and layered product online documentation (CD-ROM); requires DECwindows Bookreader.
QA-A93AA-Hx	PATHWORKS for VMS media and documentation.
QA-358AA-Hx	VAX Rdb/VMS Runtime media and documentation.
QA-VHRAA-Hx	VMS/ULTRIX Connection media and documentation. **Note:** For server systems only.
QL-VBRAx-AA	VAXcluster Software license for multiuser member systems only; included with server systems.

Select the appropriate NAS software level. See description of NAS packages on page 9.2. **Note:** The NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit
QL-MC2A*-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit
QL-MC5A*-AA	NAS 400 (Network Application Support 400)
QA-MC5AA-Hx	NAS 400 media and documentation kit

Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape; * denotes processor code

Step 8—Diagnostics and Documentation

Select optional diagnostics and hardware documentation.

Basic Diagnostics

QZ-K14AA-U5	On TK50 media
QZ-K32AA-U8	On CD-ROM media

Extended Diagnostics and Documentation

QX-K19AC-AA	Single-use TK50 license
QZ-K19AA-H5	Media on TK50
QY-K19AA-AW	Annual updates on TK50
QX-K32AA-AA	Single-use CD-ROM license
QZ-K32AA-H8	Media on CD-ROM
QY-K32AA-A8	Annual updates on CD-ROM
QZ-K19AA-GZ	Hardcopy extended maintenance documentation
MD-LEVAX-01	Maintenance documentation and diagnostics listings on microfiche (library and updates)

Hardware Documentation

QZ-K25AB-GZ	English-language (included with base system)
QZ-K258B-GZ	Multi-lingual (English, French, German)

Step 9—Power Cords

Select one for each 220/240-V system or expansion enclosure.

BN20B-2E	U.S./Canada/Japan
BN22C-2E	Australia/New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN22E-2E	U.K./Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

Step 10—Environmental Products

Select environmental power products if required. Refer to Chapter 5, *VAXcluster Options/Systems Expansion, Digital's Environmental Power Products Catalog* (EB-M4442-79), and the *DECdirect* catalog for details.

Step 11—Configuring Information

Use the templates that follow in conjunction with the configuring information that follows Rack-mountable VAX 4000 systems to validate the configuration.

VAX/VAXserver 4000 Model 300 System Template

SLOT	MODULE	Current (Amps) +5 Vdc	+12 Vdc	−12 Vdc	Power (Watts)	Bus Loads ac	dc
5*							
4*							
3*							
2*	MS670	**	0.0	0.0	**	0.0	0.0
1	KA670	7.4	0.35	0.04	42.6	3.5	1.0
1†							
2†							
3†							
4†							
5†							
6†							
7†							
Mass-storage Shelf Device							
1							
2							
3							
4							
Total these columns:							
Must not exceed:		60.0	18.0	3.0	584	35.0	20.0

BU-3246

*Reserved for memory only.

**MS670-BA: +5Vdc = 3.25 Amps; Watts = 16.25
MS670-CA: +5Vdc = 4.75 Amps; Watts = 23.75

†Q-bus slots

VAX 4000 Systems and Servers (Models 400, 500, 600)

Step 1—VAX 4000 Model 400, 500, and 600 Systems

Select system. Note that disk, tape, and diagnostics are not included in base systems and must be ordered separately. OpenVMS user licenses may be ordered as needed.

VAX/VAXserver 4000 Model 400, 500, and 600 systems include

- CPU with two embedded DSSI adapters, and one 802.3/Ethernet (ThinWire/thick wire) controller
- BA440 system pedestal enclosure
  - Five dedicated slots for the system and memory modules, and seven available Q-bus slots
- 7.6-meter (25-foot) console terminal cable
- Universal power supply that automatically adjusts to 90–128 Vac or 190–256 Vac
- 120-V power cord (220-V/240-V devices require a country-specific power cord; see Step 9)
- *DSSI VAXcluster Installation and Troubleshooting Guide* (EK-410AA-MG)
- English-language hardware documentation (QZ-K04AA-GZ)
- Factory-installed software* (VAX 4000 Model 400 systems include OpenVMS V5.5-2—TK50 and CD-ROM media—and base documentation)
- OpenVMS base license (with POSIX)
- One full-year product warranty (standard warranty recommended)

* Delivery of the software on a systems disk is not warrantied. It is provided as a convenience to the customer. Customers are encouraged to buy the necessary media and documentation, which include complete installation instructions. See Step 7.

ADVANTAGE-SERVER Systems

- NAS 300 package (with DECnet end-node license and Rdb Runtime licenses)
- Two 852-Mbyte ISEs in full-height assembly
- RRD42 600-Mbyte tabletop CD-ROM drive, includes cable and KZQSA-SA adapter

DV-44JCA-EA	Model 400 with 64 Mbytes of memory
DV-45JCA-FA	Model 500 with 128 Mbytes of memory
DV-46JCA-FA	Model 600 with 128 Mbytes of memory

OpenVMS Traditional Systems

- OpenVMS licenses for 40 users
- DECnet end-node license
- Rdb Runtime license

DV-44JT1-D9	Model 400 with 32 Mbytes of memory
DV-44JT1-E9	Model 400 with 64 Mbytes of memory
DV-45JT1-E9	Model 500 with 64 Mbytes of memory
DV-45JT1-F9	Model 500 with 128 Mbytes of memory
DV-46JT1-E9	Model 600 with 64 Mbytes of memory
DV-46JT1-F9	Model 600 with 128 Mbytes of memory

OpenVMS Base Servers

DV-44JAA-D9	Model 400 with 32 Mbytes of memory
DV-44JAA-E9	Model 400 with 64 Mbytes of memory
DV-45JAA-E9	Model 500 with 64 Mbytes of memory
DV-45JAA-F9	Model 500 with 128 Mbytes of memory
DV-46JAA-E9	Model 600 with 64 Mbytes of memory
DV-46JAA-F9	Model 600 with 128 Mbytes of memory

Step 1—VAX 4000 Model 400, 500, and 600 Systems *(Continued)*

Two-System DSSI VAXcluster Multiuser Systems

- OpenVMS base license per system
- OpenVMS unlimited-use license per system
- VAXcluster Software licenses per system
- Rdb Runtime license per system
- DECnet full-function license
- DECnet end-node license
- Two BC21M-09 DSSI bus cables

DV-44JT2-E9	Model 400 with 64 Mbytes of memory per system
DV-45JT2-F9	Model 500 with 128 Mbytes of memory per system
DV-46JT2-F9	Model 600 with 128 Mbytes of memory per system

Step 2—Storage and Q-bus Expansion

Select storage and Q-bus/storage devices as required. Refer to Chapter 7, *Storage Devices,* for further details on devices listed.

Step 2a—Internal Storage (System Enclosure)

Configuration Rules

- Selection of one DSSI disk (ISE) is required for factory-installed software.
- Order load device if necessary—VAXcluster satellite members or systems being loaded over the network do not require a load device.
- One TF85 per enclosure (BA440, R400X, B400X; maximum two TF85s per DSSI adapter).
- System enclosures support storage options in the following configurations:
  - Up to four RF7x ISEs
  - Up to three RF7x ISEs and one TKxx or TF85 tape drive
  - Up to three RF312/RF352 ISEs and one TKxx or TF85 tape drive

  Additional ISEs are housed in expansion pedestals.
- Refer to Chapter 5, *VAXcluster Options/System Expansion* for DSSI VAXcluster configuration rules.
- Single systems support seven ISEs per DSSI adapter; two-system DSSI VAXcluster configurations support six ISEs and can be connected between any pair of DSSI adapters (one adapter in each system); three-system DSSI VAXcluster configurations support five ISEs and can be connected between any three DSSI adapters (one adapter in each system).
- Maximum two Q-bus storage adapters are supported; two KFQSAs, two KDA50s, or one of each.
- Maximum two KZQSA storage adapters.
- Maximum two KLESI (TU81E) storage controllers.

DSSI Adapter

KFQSA-SE/SG	Additional Q-bus-to-DSSI adapter. Uses one Q-bus slot; factory/field installed.

Integrated Storage Elements (ISEs)

RF31T-AA/AF	381-Mbyte ISE in full-height assembly, expandable to two ISEs; factory/field installed
RF312-AA/AF	Two 381-Mbyte ISEs in full-height assembly
RF35E-AA/AF	852-Mbyte ISE in full-height assembly, expandable to two ISEs; factory/field installed
RF352-AA/AF	Two 852-Mbyte ISEs in full-height assembly
RF72E-AA/AF	1-Gbyte ISE in full-height assembly
RF73E-AA/AF	2-Gbyte ISE in full-height assembly

Tape Drives

TF85E-JA/JF	2.6-Gbyte embedded cartridge tape drive, supported by the embedded DSSI adapter; factory/field installed.
TK70E-AA/AF	296-Mbyte embedded cartridge tape drive. Requires TQK70-SA/SF controller; factory/field installed.
TQK70-SA/SF	TK70E controller; factory/field installed.

Step 2b—External Storage and Q-bus Expansion

- R400X expansion pedestals can be configured with two separate DSSI buses (requires additional BC21M-09 cable).
- 28 ISEs are supported with R400X expansion pedestals (in a single system configuration).
- Two TKxx tape drives are supported; one in system enclosure, one in B400X.
- Four Q-bus storage adapters are supported; two KFQSAs, two KDA50s, or one of each; as well as up to two KZQSAs.
- B400X/R400X expansion pedestals include the following:
  - Q-bus extender modules and two 2.7-meter (9-foot) cables (B400X)
  - 2.7-meter (9-foot) DSSI cable (BC21M-09)
  - 1.8-meter (6-foot) KZQSA cable (BC06P-06)
  - 3.0-meter (10-foot) power control cable (BC09F-10)
  - Universal power supply
  - 120-V power cord; 220/240-V devices require a country-specific power cord; see R400X/B400X descriptions that follow this ordering menu
- Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* for DSSI VAXcluster configuration rules.

B400X and R400X Expansion Pedestals

Refer to page 1.81 (expansion diagrams) and 1.82 for more information.

B400X-B9 Provides ten additional Q-bus slots and space for RF-series disk drives and one TKxx or TF85 tape drive. Factory or field installed.

R400X-B9 Provides space for RF-series disk drives and one TF85 tape drive. Factory or field installed.

Note: B400X/R400X use the same ISEs, DAT drive, and tape drives as listed in Step 2a with the exception of the TK70; TKxx tape drives are not supported in R400X expansion pedestal.

RSE Storage Expansion Pedestals

RSE storage expansion pedestals include one RSE and space for one additional RSE.

RF72B-KA Includes RF72 RSE, 2.7-meter (9-foot) DSSI cable, and documentation, factory/field installed.

RF73B-KA Same as above except includes RF73 RSE.

Note: For 240-V use, a country-specific power cord is required. Refer to Chapter 7, *Storage Devices,* for ordering information.

RSEs for RSE Storage Expansion Pedestals

RF72-RA 1-Gbyte RSE in individual removable canister.

RF73-RA 2-Gbyte RSE in individual removable canister. Requires VMS V5.5

SDI Disk Controller

KDA50-SE/SG Provides connections for four external RA-disk drives (except RA70/RA71); uses three Q-bus slots; factory/field installed. Refer to Chapter 7, *Storage Devices,* for RA-disk descriptions and ordering information.

KZQSA Adapter

KZQSA-SA/SF Required for TSZ07, TLZ06, or RRD42 tabletop devices, provides connections for two storage devices (total four devices per configuration). Uses one Q-bus slot; factory/field installed.

Tape/CD-ROM Drives

TLZ06-GA* 4.0-Gbyte tabletop DAT drive; includes 1.8-meter (6-foot) cable (BC06P-06). Requires KZQSA-SA adapter.

RRD42-FB/DH* 600-Mbyte tabletop CD-ROM drive; includes 1.8-meter (6-foot) cable (BC06P-06). Requires KZQSA-SA adapter.

TU81E-SA/SB* 40/145-Mbyte (1600/6250 bits/inch) backup tape drive in 1-meter (40-inch) cabinet; two maximum; includes cable and KLESI controller which uses one Q-bus slot; 120/240-V factory installed.

TU81E-SF/SG* 120/240-V field installed.

Step 2b—External Storage and Q-bus Expansion *(Continued)*

TSV05-SE*	40-Mbyte (1600 bits/inch) data-interchange device in 1-meter (40-inch) cabinet; one maximum; includes cable and controller which uses one Q-bus slot. Refer to Chapter 7, *Storage Devices,* for models other than 120-V.
TSZ07	1600/6250-bit/inch 9-track magtape. Refer to Chapter 7, *Storage Devices*, for ordering information.
TF85-TA*	2.6-Gbyte cartridge tape subsystem in tabletop enclosure. Requires **CK-SF100-LP** cable kit.
SF100	DSSI Storage Array Pedestal. Refer to Chapter 7, *Storage Devices,* for ordering information.
SF2x0/300/400	DSSI DECarray Storage Subsystem. Refer to Chapter 7, *Storage Devices,* for ordering information.

* 120-V power cord included. 220/240-V devices require a country-specific power cord, refer to Chapter 7, *Storage Devices.*

Step 3—Memory

Select a maximum of three additional memory modules. Systems can be expanded to 512 Mbytes of memory per system.

MS690-BA	32 Mbytes of memory, uses one dedicated memory slot; factory or field installed.
MS690-CA	64 Mbytes of memory, uses one dedicated memory slot; factory or field installed.
MS690-DA	128 Mbytes of memory, uses one dedicated memory slot; factory or field installed.

Step 4—Networks and Communications

Select devices as required. Connection of system to Ethernet requires either a thick wire 15-pin AUI right-angle transceiver cable (e.g., BNE3K) or ThinWire BNC connection (e.g., BC16M). See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for more information.

LAN Communications Controller

DESQA-SA/SF	802.3/Ethernet Controller (ThinWire/thick wire). Maximum two additional per system (one 802.3/Ethernet controller included with base system). Uses one Q-bus slot; factory/field installed.

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Software media and documentation and cables are also required. See descriptions in Chapter 6, *Networks, Communications, and Cables*, for ordering information.

DECserver 90L+, 700, 250, and MUXserver 300, 310, 380 Terminal and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources.

DEC WANrouter 150, 250, 500, and TransPATH 335, 350 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products

See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide.*

Step 5—Console Terminal

A console device is necessary for a system to function. Console cable included with system. Order video terminals (e.g., the VT420) for each system unless otherwise available. See Chapter 8, *Terminals and Printers,* for ordering information. A VT330/VT340/VT420 with split screen capability can be used as a shared console terminal.

Step 6—Terminals and Printers

Select terminals and printers as required. Serial printers connect to an asynchronous line. A cable (e.g., BC16E-25) must be ordered with each unless otherwise provided. Maximum two parallel printers per LPV11 controller; maximum two controllers per system which require one Q-bus slot each. See Chapter 8, *Terminals and Printers,* for ordering information.

Step 7—Software

Licenses required to support additional users beyond those included in base systems.

Software Processor Code	VAX 4000 Model 400 = **2** VAX 4000 Model 500 and 600 = **4**
Clusterwide License Rating	VAX 4000 Model 400 = **300** VAX 4000 Model 500 and 600 = **900**

OpenVMS User Licenses

QL-XULA9-BB	OpenVMS/VAX interactive one-user license
QL-XULA9-BC	OpenVMS/VAX interactive two-user license
QL-XULA9-BD	OpenVMS/VAX interactive four-user license
QL-XULA9-BE	OpenVMS/VAX interactive eight-user license
QL-XULA9-BF	OpenVMS/VAX interactive 16-user license
QL-XULA9-BG	OpenVMS/VAX interactive 32-user license
QL-XULA9-BH	OpenVMS/VAX interactive 64-user license
QL-XULAA-BR	OpenVMS/VAX interactive 128-user license
QL-XULAA-BR	OpenVMS/VAX interactive 256-user license
QL-XULA2-6Y	Model 400 OpenVMS/VAX interactive unlimited-use license
QL-XULA4-64	Model 500 OpenVMS/VAX interactive unlimited-use license
QL-XULA4-65	Model 600 OpenVMS/VAX interactive unlimited-use license
QA-001AA-Hx	OpenVMS media and extended documentation, including VAXcluster and DECnet documentation.
QA-09SAA-Hx	OpenVMS media and base documentation. (Model 400 systems include OpenVMS V5.2-2—TK50 and CD-ROM media and base documentation)
QA-VWJ8A-A8	OpenVMS and layered product binaries (CD-ROM) without hardcopy documentation.
QA-VWJ8B-H8	OpenVMS and layered product binaries (CD-ROM) and VMS hardcopy base documentation.
QA-VWJ8A-H8	OpenVMS and layered product binaries (CD-ROM) and VMS extended hardcopy documentation.
QA-VYR8A-G8	OpenVMS extended and layered product online documentation (CD-ROM); requires DECwindows Bookreader.
QA-A93AA-Hx	PATHWORKS for VMS media and documentation.
QA-358AA-Hx	Rdb Runtime media and documentation.
QA-GXXAA-Hx	POSIX media and documentation with IEEE documentation
QA-GXXAB-Hx	POSIX media and documentation without IEEE documentation

Select the appropriate NAS software level. See description of NAS packages on page 9.2. **Note:** The NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit
QL-MC2A*-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit
QL-MC5A*-AA	NAS 400 (Network Application Support 400)
QA-MC5AA-Hx	NAS 400 media and documentation kit

Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape; * denotes processor code

Step 8—Diagnostics and Documentation

Select optional diagnostics and hardware documentation.

Basic Diagnostics

QZ-K14AA-U5	On TK50 media
QZ-K32AA-U8	On CD-ROM media

Extended Diagnostics and Documentation

QX-K19AC-AA	Single-use TK50 license
QZ-K19AA-H5	Media on TK50
QY-K19AA-AW	Annual updates on TK50
QX-K32AA-AA	Single-use CD-ROM license
QZ-K32AA-H8	Media on CD-ROM
QY-K32AA-A8	Annual updates on CD-ROM
QZ-K19AA-GZ	Hardcopy extended maintenance documentation
MD-LEVAX-01	Maintenance documentation and diagnostics listings on microfiche (library and updates)

Hardware Documentation

QZ-K25AB-GZ	English-language (included with base system)
QZ-K258B-GZ	Multi-lingual (English, French, German)
EK-KA680-TM	VAX 4000 Model 400, 500, and 600 CPU Technical Manual

Step 9—Power Cords

Select one for each 220/240-V system or expansion enclosure.

BN20B-2E	U.S./Canada/Japan
BN22C-2E	Australia/New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN22E-2E	U.K./Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

Step 10—Environmental Products

Select environmental power products if required. Refer to Chapter 5, *VAXcluster Options/Systems Expansion, Digital's Environmental Power Products Catalog* (EB-M4442-79), and the *DECdirect* catalog for details.

Step 11—Configuring Information

Use the templates that follow in conjunction with the configuring information that follows Rack-mountable VAX 4000 systems to validate the configuration.

VAX/VAXserver 4000 Model 400, 500, and 600 System Template

SLOT	MODULE	Current (Amps) +5 Vdc	+12 Vdc	–12 Vdc	Power (Watts)	Bus Loads ac	dc
5*							
4*							
3*							
2*	MS690	**	0.0	0.0	**	0.0	0.0
1	CPU	***	***	0.0	***	***	***
1†							
2†							
3†							
4†							
5†							
6†							
7†							
Mass-storage Shelf Device							
1							
2							
3							
4							
Total these columns:							
Must not exceed:		60.0	18.0	3.0	584	35.0	20.0

BU-3075

*Reserved for memory only

**MS690-BA: +5 Vdc = 5.3 Amps; Watts = 26.5
MS690-CA: +5 Vdc = 4.2 Amps; Watts = 21.0
MS690-DA: +5 Vdc = 6.4 Amps; Watts = 32.0

***KA675 (Model 400): +5 Vdc = 3.6; +12 Vdc = 1.6; Watts = 46.0;
ac Bus Loads = 4; dc Bus Loads = 1.
KA680 (Model 500): +5 Vdc = 4.8; + 12 Vdc = 1.6; Watts = 53.8;
ac Bus Loads = 4; dc Bus Loads = 1.
KA690 (Model 600): +5 Vdc = 5.8; +12 Vdc = 1.6; Watts = 59.8;
ac Bus Loads = 4; dc Bus Loads = 1.

†Q-bus slots

VAX 4000 Model 400, 500, and 600 Specifications

Mounting type: Pedestal

Physical Characteristics		Operating	Shipping
	Height	69.0 cm (27.0 in.)	117 cm (45.6 in.)
	Width	53.0 cm (21.0 in.)	78 cm (30.5 in.)
	Depth	45.0 cm (17.8 in.)	61 cm (23.9 in.)
	Weight	66 kg (145 lb)	84.1 kg (185 lb)

Clearances		Operating	Service
	Front	5.1 cm (2.0 in.)	100.0 cm (39.4 in.)
	Rear	5.1 cm (2.0 in.)	None
	Sides	5.1 cm (2.0 in.)	None

Environmental		
Temperature	Operating	10° to 40° C (50° to 104° F)
	Nonoperating	–40° to 66° C (–40° to 151° F)
	Storage (60 days)	–40° to 60° C (–40° to 151° F)
	Rate of change	11° C per hour (20° F)
Relative Humidity	Operating	20% to 80% noncondensing
	Nonoperating	10% to 95% noncondensing
	Storage	10% to 95% noncondensing
	Storage (60 days)	10% to 95% noncondensing
	Rate of change	25% per hour
Maximum Wet Bulb Temperature	Operating	25° C (77° F)
	Storage	28° C (82° F)
Minimum Dew Point Temperature	Operating	2° C (36° F)
Maximum Heat Dissipation	Operating	2,903 Btu/hr
Air Flow and Quality	Operating	306 m^3/hr (180 ft^3/min)
	Intake location	Front top
	Exhaust location	All sides, bottom
	Particle size	N/A
	Concentration	N/A
Altitude	Operating	2438 meters (8,000 feet)
	Nonoperating	4877 meters (16,000 feet)
Mechanical Shock	Operating	10 g pk for 10 ±3 m/s
	Nonoperating	40 g pk for 30 ±3 m/s
Vibration	Operating	5–22 Hz @ .01"da minimum 22–500 Hz @ .25g maximum
Acoustics	Operating	5.5 bels, 40 dBA (typical)
	Idle	5.2 bels, 37 dBA (typical)

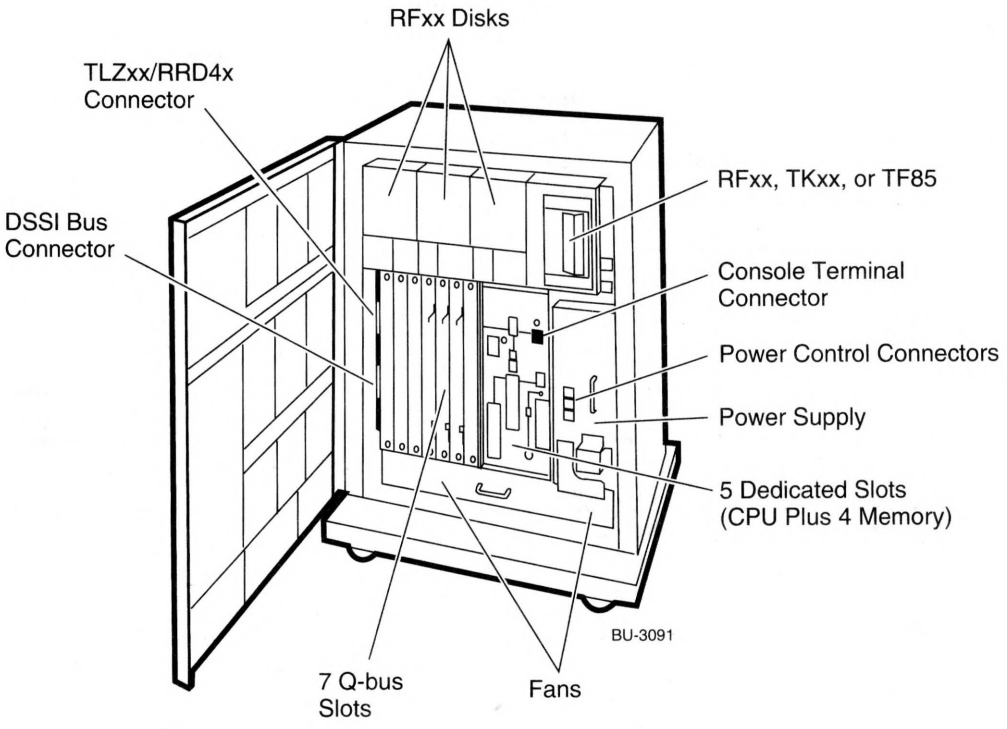
	Nominal AC Voltage			
Electrical	**101**	**120**	**220**	**240**
Voltage range (Vac)	90–110	104–128	176–242	186–264
Power source phase	Single	Single	Single	Single
Nominal frequency (Hz)	50–60	50–60	50–60	50–60
Frequency range (Hz)	47–63	47–63	47–63	47–63
RMS current (steady state) at nominal valtage (amps)	11.9	11.2	6.1	5.8
Startup current—30 s (amps)	12.6	10.6	6.2	5.8
Maximum inrush current (amps)	100	100	83	83
Maximum power consumption (Watts)	850	850	850	850

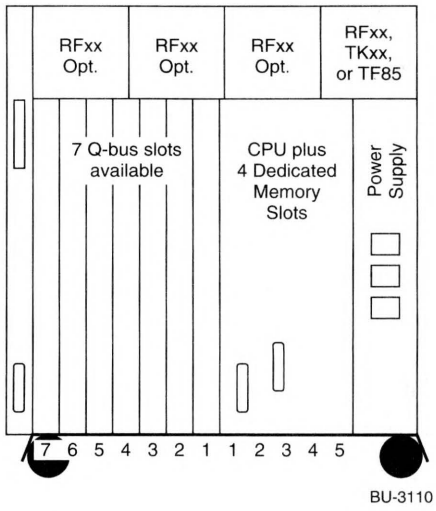
Power Cord		
	Type	IEC 320 C16
	Length	190 cm (75 in.)
	U.S. plug	NEMA 5-15, Socket IEC 320 Sheet, C-15

* Built-in universal power supply automatically selects the correct voltage range for either 120-V or 240-V operation.

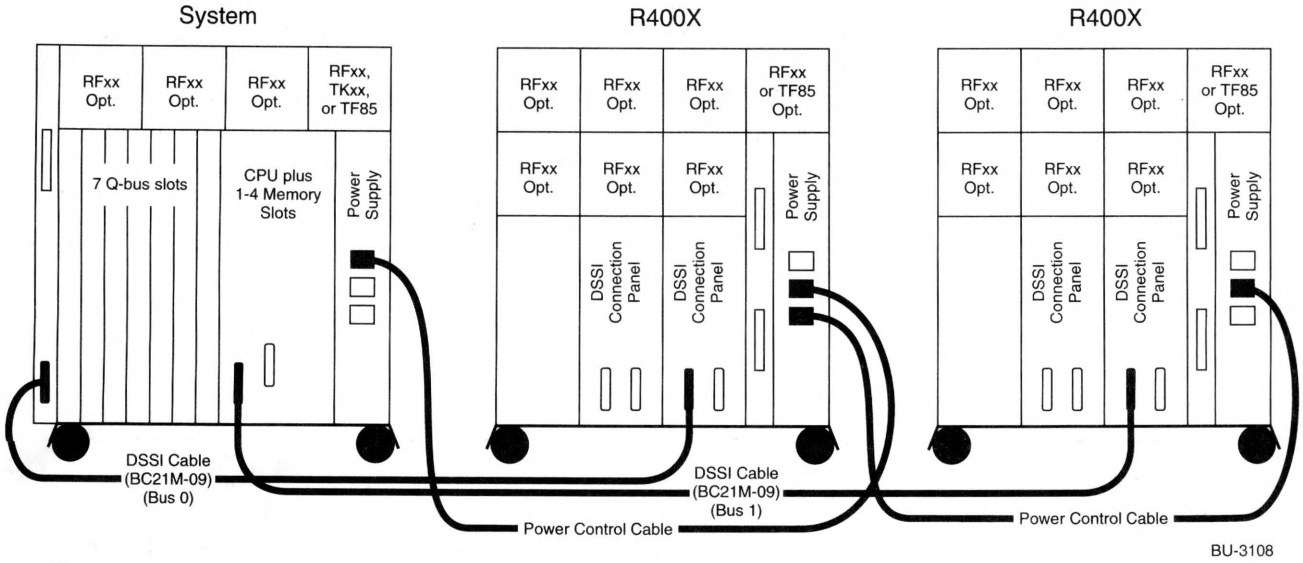
Agency Approvals		
	UL 114 (office equipment)	VDE 0875 (RFI suppression)
	UL 478 (EDP units)	Australian AS C 100
	CSA C22.2 no.134 (office equipment)	IEC Publication 950
	CSA C22.2 no.154 (data processing)	FCC Part 15 Docket 20780

VAX 4000 Model 400, 500, and 600 System Diagrams



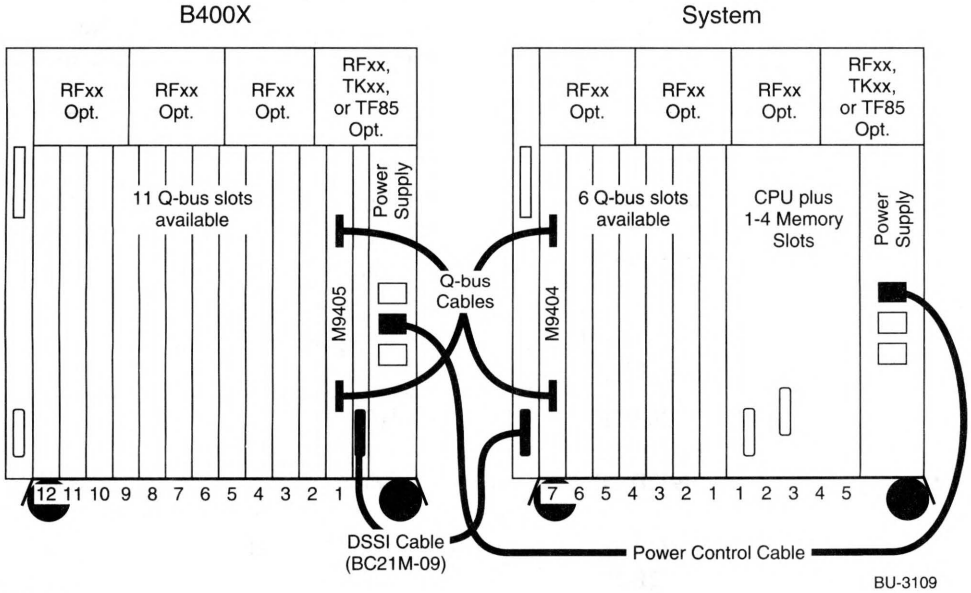


VAX 4000 Model 300, 400, 500, and 600 Expansion Diagrams



Notes:

- Two power control cables connect the system to the two R400X expanders. These power control cables permit the power to be turned on and off for the entire expanded system with the on/off switch on the system power supply.
- The R400X expander includes a 9-foot (2.7-meter) DSSI cable and one power control cable.



Notes:

- A power control cable connects the system to the B400X expander. This power control cable permits the power to be turned on and off for the entire expanded system with the on/off switch on the system power supply.
- B400X expander includes a 9-foot (2.7-meter) DSSI cable and one power control cable and Q-bus extender modules with cables.

R400X and B400X Expansion Pedestals

Storage Expansion Pedestal

R400X-B9 Storage expansion pedestal; provides seven storage cavities; each storage cavity houses one 5.25-inch RF-disk or one 3.5-inch RF3x disk or one dual RF3x disk assembly (RF3x2). The top right cavity can house one 5.25-inch tape (TF85E-Jx). The R400X can be configured with one or two DSSI buses (split bus). In single-bus mode, R400X supports seven DSSI devices—in split bus mode, the top tier (four storage cavities) is dedicated to one bus, and the lower tier (three storage cavities) is dedicated to the other bus. TKxx devices are not supported in R400X enclosure. Included with the enclosure are one 9-foot (2.7-m) DSSI cable (BC21M-09), one 3.0-meter (0.9-foot) power control cable (BC09F-10), and one 6-foot (1.8-m) KZQSA cable (BC06P-06), universal power supply, and 120-V power cord (for non-120-V use, a country-specific power cord is required). **Note:** Additional BC21M-09 cables may be required for split bus or DSSI VAXcluster configurations. Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* for DSSI VAXcluster configuration rules.

Specifications

Height	69 cm (27.0 in.)
Width	53 cm (21.0 in.)
Depth	45 cm (17.8 in.)
Weight	68 kg (150 lb), fully configured

Q-bus and Storage Expansion Pedestal

B400X-B9 Q-bus and storage expansion pedestal; provides four storage cavities and 10 additional Q-bus slots. B400X has 12 slots, one slot in the system and one slot in B400X are used to make the connection between the enclosures—modules and cables required for the connection are included. Each storage cavity can house one 5.25-inch RF-disk or 3.5-inch RF3x disk or one dual RF3x disk assembly (RF3x2). The right cavity can house one 5.25-inch tape (TF85E-Jx/TKxx). Included with the enclosure are Q-bus extender modules, 9-foot (2.7-m) Q-bus cables, one 9-foot (2.7-m) DSSI cable (BC21M-09), one 3.0-meter (0.9-foot) power control cable (BC09F-10), and one 6-foot (1.8-m) KZQSA cable (BC06P-06), universal power supply, and 120-V power cord (for non-120-V, a country-specific power cord is required). **Note:** See VAX 4000 Expansion Diagrams for supported storage configurations in R400X and B400X pedestals.

Specifications

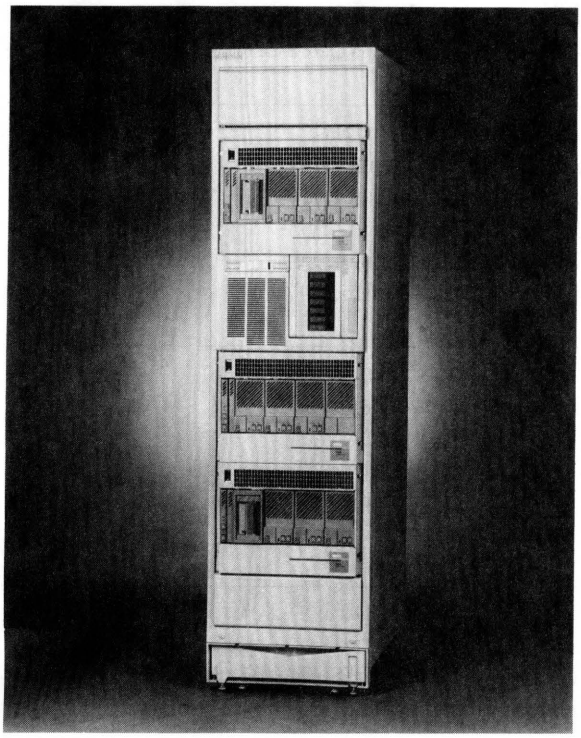
Height	69 cm (27.0 in.)
Width	53 cm (21.0 in.)
Depth	45 cm (17.8 in.)
Weight*	68 kg (150 lb), fully configured

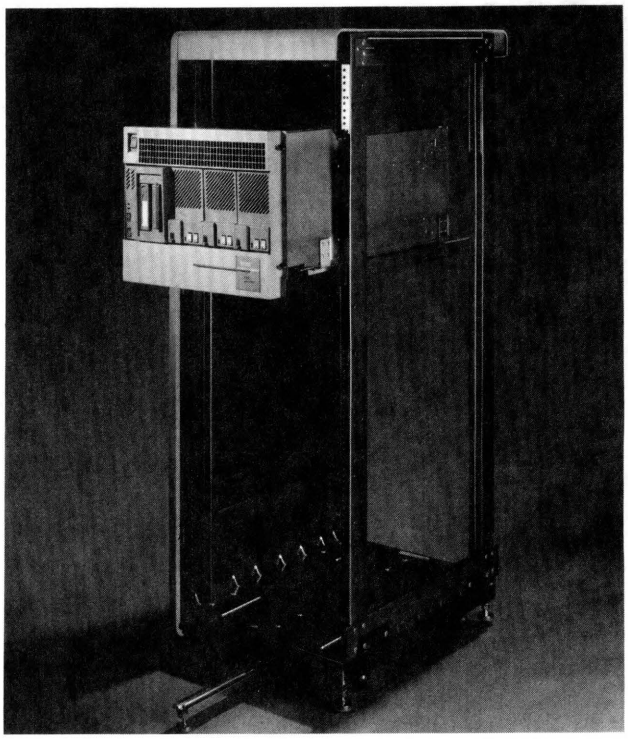
Power Cords

Select one for each 220/240-V expansion pedestal; 120-V power cord is included.

BN20B-2E	U.S./Canada/Japan
BN22C-2E	Australia/New Zealand
BN22D-2E	Austria, Belgium, France, Germany, Finland, Netherlands, Portugal, Spain, Sweden
BN22E-2E	United Kingdom/Ireland
BN22F-2E	Switzerland
BN22H-2E	Denmark
BN22J-2E	Italy
BN22K-2E	India
BN22L-2E	Israel

Rack-mountable VAX 4000 Systems





Product Description

Rack-mountable VAX 4000 systems are mechanically reconfigured VAX 4000 pedestal systems capable of being mounted into a 19-inch-wide ANSI/EIA (formerly RETMA) and MIL-STD-compatible cabinet.

Rack-mountable VAX 4000 systems are ideal for two- or three-system DSSI VAXcluster configurations. The rack-mountable systems can be configured in cabinets with other peripherals to save floorspace, and can be configured to customer requirements in the factory or on-site.

Rack-mountable VAX 4000 Models 400, 500, and 600 are offered in a BA441 chassis. They are identical to VAX 4000 Model 400, Model 500, and Model 600 pedestal systems' functionality and configuration requirements.

Rack-mountable VAX 4000 systems feature front-to-back airflow. This allows systems to be stacked, efficiently utilizing vertical rack or cabinet space. They can also be installed in environmental cabinets for use in harsh environments. Rack-mountable VAX 4000 systems chassis are slide equipped for easy maintenance and configuring. Slides and cable management brackets are included with all VAX 4000 rack-mountable systems.

Items to consider when selecting a 19-inch rack, cabinet, or enclosure:

- Each BA431 or BA441 requires 35.5 cm (14 inches) of vertical rack space.
- Power controller as well as voltage and total current requirements
- Face or filler panel requirements
- Front door must be louvered in the area of the BA431/BA441 chassis to accommodate 180 ft^3/min of cooling air
- Rear door must be louvered in the area of the BA431/BA441 chassis to accommodate 180 ft^3/min of cooling air
- Front stabilizer leg or bar *must* be provided to compensate for systems being pulled out for servicing *or* cabinets must be secured to the floor or to another cabinet in order to prevent overturning

Ordering Information

Note: With the exception of the BA441 rackmount enclosure, systems include the same items as the VAX 4000 pedestal systems listed on page 1.72.

Traditional Systems

DV-44LT1-D9	Model 400 (32 Mbytes of memory)
DV-44LT1-E9	Model 400 (64 Mbytes of memory)
DV-45LT1-E9	Model 500 (64 Mbytes of memory)
DV-45LT1-F9	Model 500 (128 Mbytes of memory)
DV-46LT1-E9	Model 600 (64 Mbytes of memory)
DV-46LT1-F9	Model 600 (128 Mbytes of memory)

OpenVMS Base Systems

DV-44LAA-D9	Model 400 (32 Mbytes of memory)
DV-44LAA-E9	Model 400 (64 Mbytes of memory)
DV-45LAA-E9	Model 500 (64 Mbytes of memory)
DV-45LAA-F9	Model 500 (128 Mbytes of memory)
DV-46LAA-E9	Model 600 (64 Mbytes of memory)
DV-46LAA-F9	Model 600 (128 Mbytes of memory)

Two-System DSSI VAXcluster Multiuser Systems

DV-44LT2-E9	Model 400 two-system DSSI VAXcluster (with 64 Mbytes of memory in each system)
DV-44LT2-E2/EA	Model 400 two-system DSSI VAXcluster (with 64 Mbytes of memory in each system) in H9602 cabinet; 120/240 V
DV-45LT2-F9	Model 500 two-system DSSI VAXcluster (with 128 Mbytes of memory in each system)
DV-45LT2-F2/FA	Model 500 two-system DSSI VAXcluster (with 128 Mbytes of memory in each system) in H9602 cabinet; 120/240 V
DV-46LT2-F9	Model 600 two-system DSSI VAXcluster (with 128 Mbytes of memory in each system)
DV-46LT2-F2/FA	Model 600 two-system DSSI VAXcluster (with 128 Mbytes of memory in each system) in H9602 cabinet; 120/240 V

Configuring Information

Refer to appropriate VAX 4000 Model 400, 500, 600 configuration rules.

Note: On the previous page, the left photo shows a three-system DSSI VAXcluster custom configured in an H9702 cabinet. The right photo shows a single VAX 4000 mounted in an H9602 cabinet. Contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990 for information about these systems or custom configurations.

Specifications/Site Preparation

Physical Characteristics		
	Height	35.5 cm (14 in.)
	Width	48.2 cm (19 in.)
	Depth	74.73 cm (29.42 in.)
	Weight‡	System weight (approximately) 58 kg (128 lb) Shipping weight (approximately) 64 kg (141 lb)
Mounting Requirements	Conforms to ANSI/EIA ES-310-C-77 and MIL-STD 189 standards for a 19-inch panel width and 30-inch minimum depth enclosure.	

Clearances		Operating	Service
	Front	20.3 cm (8 in.)	76.0 cm (30 in.)
	Rear	20.3 cm (8 in.)	9.0 cm (36 in.)
	Sides	None	None

Environmental		
Temperature	Operating	10° to 40° C (50° to 104° F)
	Nonoperating	–40° to 66° C (–40° to 151° F)
Relative Humidity	Operating	20% to 80% noncondensing
	Nonoperating	10% to 90% noncondensing
Cooling Air Required	306 m^3/hr (180 ft^3/min.)	
Altitude	Operating	2438 meters (8,000 feet)
	Nonoperating	4877 meters (16,000 feet)
Mechanical Shock	Operating	10 g pk for 10 ±3 m/s, 1/2 sine wave all 3 axes
	Nonoperating	Incline impact to 1.75 m/s (5.75 ft/s) all sides; Tilt drop to 20.3 cm (8 inches)
Acoustics	Operating	5.5 bels, 40 dBA
	Idle	5.2 bels, 37 dBA

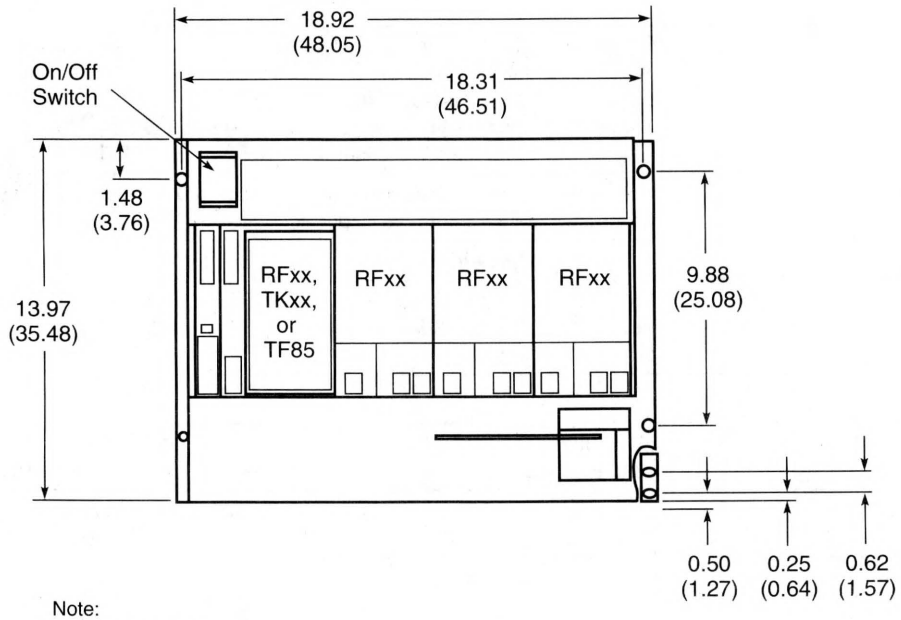
	Nominal AC Voltage			
Electrical	**101**	**120**	**220**	**240**
Voltage range (Vac)	90–110	104–128	176–242	186–264
Power source phase	Single	Single	Single	Single
Nominal frequency (Hz)	50–60	50–60	50–60	50–60
Frequency range (Hz)	47–63	47–63	47–63	47–63
RMS current (steady state) at nominal voltage (amps)	11.9	11.2	6.1	5.8
Startup current—30 s (amps)	12.6	10.6	6.2	5.8
Maximum inrush current (amps)	100	100	83	83
Maximum power consumption (Watts)	850	850	850	850
Heat dissipation (Btu/hr)	2978	2978	2978	2978
Circuit breaker rating (amps)	14	14	14	14
Power supply power connector	IEC 320 C16	IEC 320 C16	IEC 320 C16	IEC 320 C16
U.S. power cord plug†	NEMA 5-15P	NEMA 5-15P	NEMA 5-16P	NEMA 5-16P

* Built-in universal power supply automatically selects the correct voltage range for either 120-V or 240-V operation.

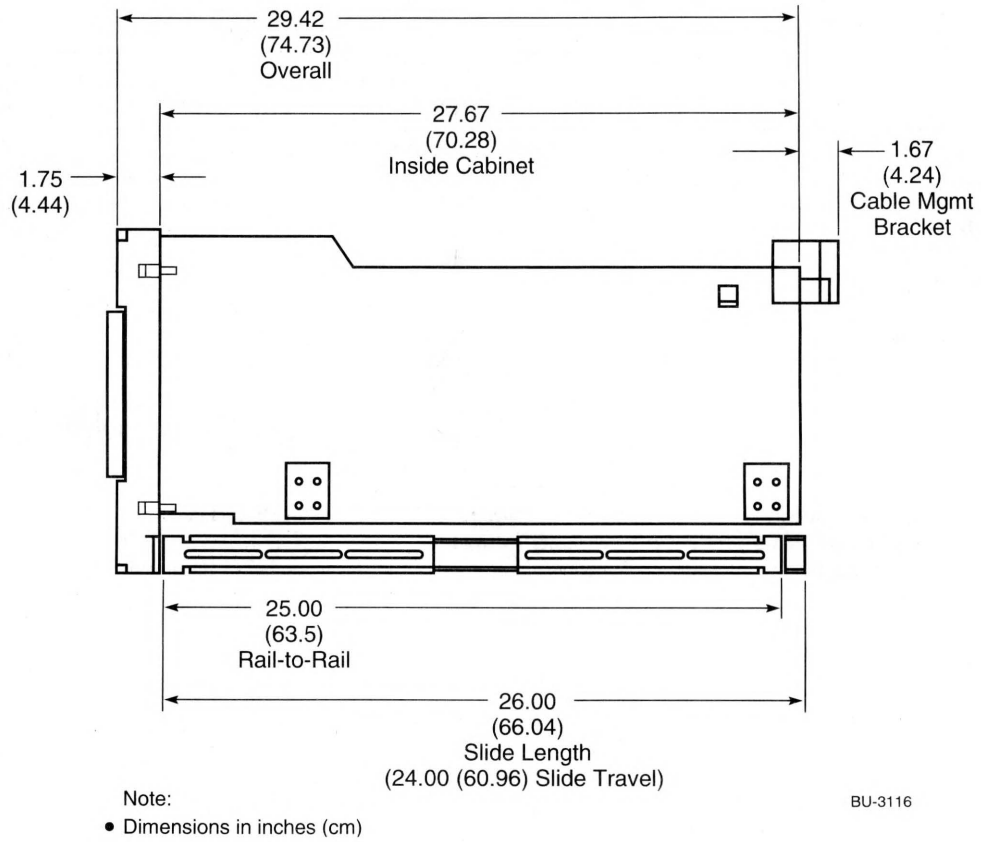
† Standard U.S. 15A 3-pin 120-Vac plug. Power cords for other countries are available.

‡ Weight given is for typical enclosure fully loaded with module options, power supply, maximum number of Integrated Storage Elements, and one tape drive.

Rack-mountable VAX 4000 System Mounting Diagrams



Front View



Side View

Note: VAX 4000 Models 400, 500, and 600 require MS690 memory.

MS690-UC	64 Mbytes of memory (MS690). Requires return of 32 Mbytes of memory (MS670-BA).
MS690-UD	128 Mbytes of memory (MS690). Requires return of 64 Mbytes of memory (one MS670-CA or two MS670-BA).

Note: The following upgrade kits are for VAX/VAXserver 4000 Model 300 systems with serial numbers WF00000000 through WF04899999 and AY00000000 through AY04700100.

From	To	Order Number	Includes:
VAX 4000 Model 300 Multiuser	VAX 4000 Model 400	**675XR-EE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node; new backplane.
VAX 4000 Model 300 Server	VAX 4000 Model 400	**675XR-EF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function; new backplane.
VAX 4000 Model 300 Multiuser	VAX 4000 Model 500	**680XR-EE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node; new backplane. Requires MS690 memory.
VAX 4000 Model 300 Server	VAX 4000 Model 500	**680XR-EF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function; new backplane. Replaces 680XR-AF.
VAX 4000 Model 300 Multiuser	VAX 4000 Model 600	**690XR-EE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node; new backplane. Replaces 690XR-AE.
VAX 4000 Model 300 Server	VAX 4000 Model 600	**690XR-EF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function; new backplane. Replaces 690XR-AF.

Note: The following upgrade kits are for VAX/VAXserver 4000 Model 300 systems with serial numbers WF04900000 and higher, AY04700101 and higher, and serial numbers that begin KA or NI.

From	To	Order Number	Includes:
VAX 4000 Model 300 Multiuser	VAX 4000 Model 400	**675XR-FE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node.
VAX 4000 Model 300 Server	VAX 4000 Model 400	**675XR-FF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function.
VAX 4000 Model 300 Multiuser	VAX 4000 Model 500	**680XR-FE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node. Replaces 680XR-BE.
VAX 4000 Model 300 Server	VAX 4000 Model 500	**680XR-FF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function. Replaces 680XR-BF.
VAX 4000 Model 300 Multiuser	VAX 4000 Model 600	**690XR-FE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node. Replaces 690XR-BE.
VAX 4000 Model 300 Server	VAX 4000 Model 600	**690XR-FF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function. Replaces 690XR-BF.

VAX 4000 Upgrades and Conversion Kits

All software must be upgraded to the proper rating when upgrading from server to timeshare systems. The following upgrades replace the CPU in the existing system enclosure.

From	To	Order Number	Includes new CPU and
VAXserver 4000 Model 300	VAX 4000 Model 300	**670XR-AA**	VMS 1- to 40-user license, VAXcluster license, and DECnet end-node license.
MicroVAX 3500/3600 3800/3900	VAX 4000 Model 200	**660XR-AC**	H3602 I/O panel, VMS unlimited-user license, and DECnet end-node license. Requires MS650-Bx memory.
MicroVAX 3300/3400	VAX 4000 Model 200	**660XR-CC**	VMS unlimited-user license, and DECnet end-node license. Requires MS650-Bx memory.
MicroVAX 3500/3600, 3800/3900	VAX 4000 Model 200	**660XR-AA**	H3602 I/O panel, VMS 1- to 40-user license, and DECnet end-node license. Requires MS650-Bx memory.
VAXserver 3500/3600, 3800/3900	VAXserver 4000 Model 200	**660XR-BA**	H3602 I/O panel, VMS File and Application Server license, DECnet full-function license, VAXcluster license, and VMS/ULTRIX Connection license. Requires MS650-Bx memory.
MicroVAX 3300/3400	VAX 4000 Model 200	**660XR-CA**	VMS 1- to 20-user license, and DECnet end-node license. Requires MS650-Bx memory.
VAXserver 3300/3400	VAXserver 4000 Model 200	**660XR-DA**	VMS File and Application Server license, DECnet full-function license, VAXcluster license, and VMS/ULTRIX Connection license. Requires MS650-Bx memory.
VAXserver 4000 Model 200	VAX 4000 Model 200	**660XR-EA**	VMS 1- to 20-user license, DECnet end-node license, and VAXcluster Software license.
VAXserver 3100 Model 10 or 20	VAXserver 3100 Model 10e or 20e	**310XR-EA**	VMS File and Application Server license, and DECnet end-node license.
VAX 4000 Model 400	VAX 4000 Model 500	**680XR-HJ**	Upgrade license for OpenVMS Base.
VAX 4000 Model 400	VAX 4000 Model 600	**690XR-HJ**	Upgrade license for OpenVMS Base.
VAX 4000 Model 500 Multiuser	VAX 4000 Model 600	**690XR-JE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node. Replaces 690XR-DE.
VAX 4000 Model 500 Server	VAX 4000 Model 600	**690XR-JF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function. Replaces 690XR-DF.
VAX 4000 Model 500 OpenVMS Base	VAX 4000 Model 600	**690XR-JJ**	Upgrade license for OpenVMS Base.

VAX 4000 Systems and Servers Options

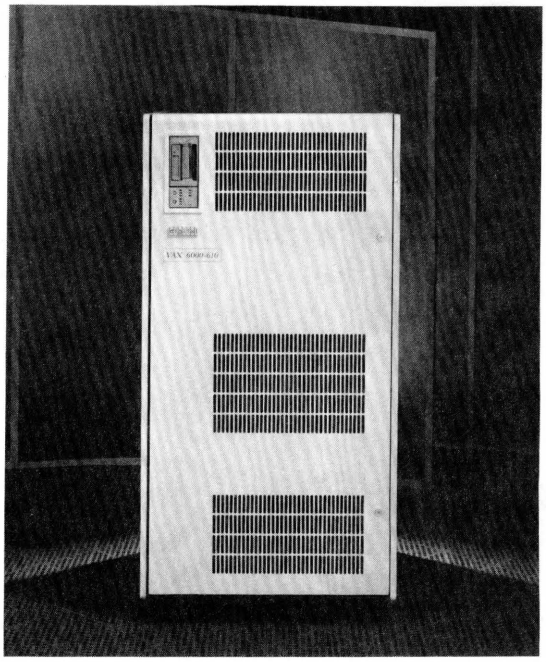
This hardware support table specifies options supported on VAX 4000 systems and should be used as a guideline only. Maximum options supported are dependent on bus loads device drivers, and applications.

Option	Description	Maximum Supported	Q-bus Slots	Current (Amps) (Max)		Power (Max)	Bus Loads	
				5 V	12 V	Watts	ac	dc
AAV11-SA/SF	2-channel D/A with 12-bit resolution; drivers available with DEC RT Integrator software	2	1	2.10	0.00	10.50	2.5	0.5
ADQ32-SA/SF	12-bit, 200 kHz A/D; 32 single-ended/16 different channels; drivers available with DEC RT Integrator software	2	1	4.45	0.00	22.25	2.5	0.5
ADV11-SA/SF	12-bit, 50 kHz A/D, 16 single-ended/8 different channels; drivers available with DEC RT Integrator software	2	1	2.00	0.00	10.00	2.3	0.5
AXV11-SA/SF	16 single-ended, 8 differential channels, 25 kHz A/D and two-channel D/A; drivers available with DEC RT Integrator software	2	1	2.00	0.00	10.00	1.2	0.3
CXA16-AA/AF	16 asynchronous serial lines, EIA-423A, no modem control (not supported by DECnet-VAX)	Note 5	1	1.60	0.20	10.40	3.0	0.5
CXB16-AA/AF	16 asynchronous serial lines, EIA-422, no modem control (not supported by DECnet-VAX)	Note 5	1	2.00	0.00	10.00	3.0	0.5
CXY08-AA/AF	8 asynchronous serial lines, EIA-232C, modem control	Note 5	1	1.64	0.40	12.94	3.0	0.5
DEQRA-CA	Token Ring Q-bus adapter. Uses same configuration guidelines as DESQA Ethernet interface for backplane placement. Requires VMS V5.5 and MDM V136 for full DEQRA support.	2	1	5.0	0.1	26.2	5.0	4.27
DESQA-SA/SF	Second 802.3/Ethernet interface (ThinWire or thick wire)	2	1	2.40	0.22	14.64	3.3	0.5
DFA01-AA/AF	Dual 2400-baud modem with interface	2	1	1.90	0.04	10.30	3.0	1.0
DJ-DFA01-xx	Dual 2400-baud modem with interface and VAX Public Access Communications software. **Note:** For VMS multiuser systems only.	2	1	1.90	0.04	10.30	3.0	1.0
DIV32-SA/SF	Q-bus ISDN rate access communication interface (not supported by DECnet-VAX)	2	1	5.50	0.00	27.50	3.5	1.0
DPV11-SA/SF	Single-line EIA-232/EIA-422/EIA-423 synchronous serial line interface	3	1	1.20	0.30	9.60	1.0	1.01
DRQ3B-SA/SF	Double buffered DMA parallel interface; 1.3 MHz; drivers available with DEC RT Integrator software	1 (Note 1)	1	4.50	0.00	22.50	2.0	0.5
DRV1J-SA/SF	64-line digital I/O interface (drivers available in DEC RT Integrator software)	1	1	1.80	0.00	9.00	2.0	1.0
DRV1W-SA/SF	16-bit parallel interface (drivers available in DEC RT Integrator software)	1	1	1.80	0.00	9.00	2.0	1.0
DSV11-SA/SF	Synchronous serial-line interface providing two high-speed connections to SNA, X.25, and DECnet networks; VAX 4000 Model 300 requires VAX Wide Area Network Device Drivers V1.1A **Note:** Order one per system—order DSV11-SB/SG for additional DSV11s (not supported by DECnet-VAX).	1	1	5.43	0.69	35.43	3.9	1.0
DSV11-SB/SG	Additional synchronous serial-line interface option. **Note:** Total of five DSV11s per system	4	1	5.43	0.69	35.43	3.9	1.0
DTC05-SA	Voice processing module (Note 4)	Note 4	1	4.0	0.0	15.8	3.6	0.75
DTCN5-UG	T1 telephony upgrade kit (Note 4)	Note 4	2	7.17	0.0	35.8	7.0	1.5
IBQ01-SA/SF	BITBUS-to-Q-bus interface	Note 5	1	5.00	0.30	28.60	4.6	1.0

Option	Description	Maximum Supported	Q-bus Slots	Current (Amps) (Max)		Power (Max)	Bus Loads	
				5 V	12 V	Watts	ac	dc
IEQ11-SA/SF	IEEE-488 Q-bus interface providing two IEEE buses, each with DMA capability; drivers available with VAXlab software	1	1	3.50	0.00	17.50	2.0	1.0
KDA50-SE/SG	SDI disk controller	2	3	13.50	0.03	67.86	3.0	0.5
KFQSA-SE/SG	DSSI storage adapter	2	1	5.50	0.00	27.50	4.4	0.5
KLESI-SA/SF	Controller for (and included with) TU81E and RSV20	2	1	4.00	0.00	20.00	0.5	1.0
KWV11-SA/SF	Programmable realtime clock; drivers available with DEC RT Integrator software	2	1	2.20	0.01	11.16	1.0	0.3
KXJ11-SF	Realtime or I/O processor; supported by VAX Coprocessor/RSX software; field installed only	1 (Notes 2,3)	1	5.10	0.70	33.90	2.0	1.0
KZQSA-SA/SF	TLZxx/RRD4x/TSZxx adapter	2	1	5.40	0.0	27.00	4.4	0.5
LPV11-SA	Controller for (and included with) parallel printers	2	1	2.80	0.00	14.00	1.8	0.5
MRV11-D	ROM option; field installed only	1	1	1.60	0.00	8.00	3.0	0.5
MS650-BA/BF	16-Mbyte memory option for Model 200	4 (Notes 2,3)	1	3.50	0.00	17.50	0.0	0.0
MS650-BB/BH	8-Mbyte memory option for Model 200	4 (Notes 2,3)	1	3.10	0.00	15.50	0.0	0.0
MS650-BC/BJ	32-Mbyte memory option for Model 200	2 (Notes 2,3)	1	2.80	0.0	14.0	0.0	0.0
MS670-BA	32-Mbyte memory option for Model 300	4 (Notes 1,3)	1	3.25	0.0	16.25	0.0	0.0
MS670-CA	64-Mbyte memory option for Model 300	4 (Notes 1,3)	1	4.75	0.0	23.75	0.0	0.0
MS690-BA	32-Mbyte memory option for Model 500	4 (Notes 1,2)	1	8.2	0.00	41.0	0.0	0.0
MS690-CA	64-Mbyte memory option for Model 500	4 (Notes 1,2)	1	6.1	0.00	30.5	0.0	0.0
MS690-DA	128-Mbyte memory option for Model 500	4 (Notes 1,2)	1	8.2	0.00	41.0	0.0	0.0
M7530-PA	Controller for (and included with) TSV05	Note 5	1	2.50	0.00	12.50	3.0	1.0
RF31T-xx	381-Mbyte 3.5-inch full-height DSSI ISE	Note 6	N/A	1.71	0.85	13.7	0.0	0.0
RF312	Two 381-Mbyte 3.5-inch ISEs	Note 7	N/A	3.42	1.70	27.4	0.0	0.0
RF35	852-Mbyte 3.5-inch full-height ISE	Note 6	N/A	0.75	0.95	15.15	0.0	0.0
RF352	Two 852-Mbyte 3.5-inch full-height ISEs	Note 6	N/A	1.50	1.90	30.30	0.0	0.0
RF72E-xx	1-Gbyte 5.25-inch full-height ISE	Note 6	N/A	1.20	1.75	27.00	0.0	0.0
RF73E-xx	2-Gbyte 5.25-inch full-height ISE	Note 6	N/A	1.20	1.75	27.00	0.0	0.0
TF85-TA	2.6-Gbyte cartridge tape subsystem in tabletop enclosure	Note 7	N/A	N/A	N/A	N/A	N/A	N/A
TF85E-JA/JF	2.6-Gbyte embedded cartridge tape subsystem	Note 7	N/A	1.5	1.5	36.30	0.0	0.0
TK50E-xx	95-Mbyte embedded tape drive (one per controller)	2	N/A	1.35	2.40	35.55	0.0	0.0
TQK50-xx	Controller for TK50 (second device is mounted in expansion enclosure)	2	1	2.90	0.00	14.50	2.8	0.5
TK70E-xx	295-Mbyte embedded tape drive (one per controller)	2	N/A	1.50	2.40	36.30	0.0	0.0
TQK70-xx	Controller for (second device is mounted in expansion enclosure)	2	1	3.50	0.00	17.50	4.3	0.5
VS30U-xx	8-plane color graphics controller (QDSS)	1	3	12.60	0.75	72.00	3.5	1.0

[1] Not supported on Model 200.
[2] Not supported on Model 300.
[3] Not supported on Models 500/600.
[4] Refer to Multiline DECvoice in Chapter 4, *Specialized Systems.*
[5] Number of modules limited only by Q-bus slot/power availability.
[6] Number of drives limited by number of DSSI controllers (KFQSA and embedded adapter) supported by the system as well as power availability.
[7] Maximum two per DSSI bus.

VAX 6000 Systems and Servers



Product Description

The VAX 6000 system is ideal for the rigorous demands of the datacenter. Its CPU power balances well with large memory and storage capacity, fast I/O, and vector processing options to provide a high-performance system that's up to the challenge of the most demanding datacenter applications. Its modular platform allows users to constantly improve performance while building upon the value of their initial investment.

A broad range of system performance—from 7 to as much as 150 times the processor performance of the VAX-11/780 (depending on the VAX 6000 model chosen)—is made possible by a unique modular platform strategy featuring symmetric multiprocessing (SMP)—key to VAX 6000 systems growth. This platform strategy designs out obsolescence by allowing the expansion of performance up to 50 times in the same cabinet in minutes simply by adding or changing modules. Memory and I/O also expand easily, and placing the VAX 6000 system in a VAXcluster allows a further increase in availability and storage capacity.

The VAX 6000 system allows the addition of up to 512 Mbytes of memory in 32-, 64-, and 128-Mbyte increments, and increased I/O speed to keep pace with the expanded capabilities of the CPU—as easily as additional processors are added.

The VAX 6000 system's I/O design begins with the 100-Mbyte-per-second, XMI high-speed system bus. This bus features a streamlined bus structure, plus 14 slots to provide for growth. XMI I/O controllers include: a CI VAXcluster controller, DSSI storage controllers, and Ethernet and FDDI controllers. Each controller has its own high-speed processor, to increase the I/O speed. Additionally, up to five VAXBI buses can be added. Two VME bus adapters that connect to over 4,000 industry-standard VME options can also be added.

Vector processing offers yet another option for VAX 6000 system growth. An integrated VAX vector processor can offer 3 to 20 times faster execution time over a scalar processor for compute-intensive FORTRAN or APL applications. And VAX vector processing is fully supported by a wide range of applications and development tools. VAX 6000 systems with vector processing offer supercomputing performance at economical prices.

Product Description *(Continued)*

VAX 6000 system bandwidth—up to 100 Mbytes per second—comes from a balanced approach that encompasses the entire system, from the CPU, to buses and storage controllers, to disks and software tools. This approach means that critical data moves through the system fast and keeps the datacenter operating at peak performance.

VAX 6000 systems are powerful enough to function as servers connecting hundreds of PCs, as high-speed database engines, and as transaction processing systems for a widely distributed user base. Enhanced multivendor networking capabilities plus a commitment to applications portability support users goals for an open computing environment.

Best of all, the VAX 6000 is a member of the compatible VAX family of computers. It offers a choice of the robust and open VMS operating system or ULTRIX, Digital's implementation of the UNIX operating system. Digital's approach to open systems computing ensures application portability, as well as the exceptional dependability, data integrity, system management, and security expected from VAX systems.

The high availability built into the VAX 6000 system through the VMS operating system offers maximum uptime and protection of data. And when even higher availability is required, it's made possible in the following ways.

- An entry-level VAX 6000 Digital Storage Systems Interconnect (DSSI) VAXcluster system offers increased system uptime and availability, because if one system goes down, the others can continue processing critical data.
- When more systems and storage are needed, a CI-based VAXcluster system offers even greater flexibility and superior system, application, and data availability.
- A fault-tolerant VAXft system used as a front end to a VAX 6000 system offers the highest level of system availability in a single location.
- The high-speed FDDI network lets users connect two VAXcluster systems in separate geographic locations up to 40 km apart.

The VMS file journaling feature protects data on a VAX 6000 system even in the event of a power failure. It records all transactions in a temporary file that allows recovery of every keystroke or file operation.

VAX 6000 systems provide complete data and transaction integrity for both distributed and centralized production environments through the transaction monitors, database management systems, and interconnect products supported by the VMS operating system.

Digital is committed to open computing. In addition to Network Application Support (NAS), which ties together applications running across a wide range of desktops and operating systems, open interfaces to the VMS operating system allow users to easily move UNIX or ULTRIX application to VMS, and to automatically benefit from the robust VMS environment.

There is a full range of upgrades available for the VAX 6000 chosen. Additional processors can be added, or faster processors can be added as they become available.

Step 1—Systems

Select system. Unless included with preconfigured system, the following items are required.

- InfoServer 150, TF85, TF857, or TK70 for software distribution
- KDM70 (SDI/STI) disk/tape controller, KFMSA (DSSI) disk/tape adapter, or CIXCD (CI) controller
- System disk device
- Console terminal
- VAXcluster Software license for each system when multiple systems are used in a VAXcluster environment

Additional items may be added as required. For optimum backup performance a high-capacity tape drive is recommended.

ADVANTAGE-SERVER Systems include

- 14-slot XMI system bus
- 64 or 128 Mbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- KFMSA disk/tape controller
- TF85 2.6-Gbyte cartridge tape drive
- Two RF73 2.0-Gbyte disks and cables
- VT420 console terminal
- LA75 Plus console printer
- VT420/LA75 table
- Console cable
- OpenVMS base license (with POSIX)
- NAS 300 package (with DECnet end-node license and Rdb Runtime license)
- One full-year product warranty (standard warranty recommended)

VAX 6000	Order Number AE = 60 Hz, 208 V AF = 50 Hz, 380/416 V	Memory	XMI Slots Available Total Slots	XMI Slots Available I/O Capable
Model 510	**SV-6E04A-AE/AF**	64 Mbytes	10	8
Model 510	**SV-6E04C-AE/AF**	128 Mbytes	10	8
Model 610	**SV-6F04B-AE/AF**	64 Mbytes	10	8
Model 610	**SV-6F04E-AE/AF**	128 Mbytes	10	8

Preconfigured DSSI VAXcluster Systems include

- VAX 6000 systems with 14-slot XMI system bus
- 128 Mbytes of memory per system
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller per system
- KFMSA disk/tape controller per system
- SF210 storage array with four RF73 disks and TF857 tape drive for Model 610; SF200 storage array with eight RF72 disks and TF857 tape drive for Model 510
- VT420 console terminal per system
- LA75 Plus console printer per system
- VT420/LA75 table per system
- Console cable per system
- Network kit for InfoServer (DESTA and BC16M) per system
- Battery Backup Unit (BBU) per system
- VMS unlimited-user license (with Rdb/VMS Runtime) per system
- VAXcluster Software license per system
- DECnet full-function licenses (with PATHWORKS for VMS) per system
- PATHWORKS for VMS media and documentation
- One full-year product warranty (standard warranty recommended)

VAX 6000	Order Number AK = 60 Hz, 208 V AN = 50 Hz, 380/416 V	Configuration	XMI Slots Available Total Slots	XMI Slots Available I/O Capable
Model 510	**DV-6E03A-AK/AN**	Two VAX 6000-510 systems	10	8
Model 610	**DV-6F04D-AK/AN**	Two VAX 6000-610 systems	10	8
Model 610	**DV-6F04B-AK/AN**	Three VAX 6000-610 systems	10	8

Step 1—Systems *(Continued)*

Traditional Systems include

- 14-slot XMI system bus
- 64 or 128 Mbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- Console cable
- VMS unlimited-user license (with Rdb/VMS Runtime)
- DECnet full-function license (with PATHWORKS for VMS) unless noted differently
- PATHWORKS for VMS media and documentation
- One full-year product warranty (standard warranty recommended)

VAX 6000	Order Number AE = 60 Hz, 208 V AJ = 50 Hz, 380/416 V	Memory	XMI Slots Available Total Slots	XMI Slots Available I/O Capable
Model 510	**65AMD-AE/AJ**	64 Mbytes	11	9
	65AME-AE-AJ	128 Mbytes	11	9
Model 610	**66AMC-AE/AJ**	64 Mbytes	11	9
	66AMA-AE/AJ	128 Mbytes	11	9

Base Servers include

- 14-slot XMI system bus
- 64 or 128 Mbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- Console cable
- OpenVMS base license (with POSIX)
- One full-year product warranty (standard warranty recommended)

VAX 6000	Order Number AA = 60 Hz, 208 V AB = 50 Hz, 380/416 V	Memory	XMI Slots Available Total Slots	XMI Slots Available I/O Capable
Model 510	**65AMD-AA/AB**	64 Mbytes	11	9
	65AME-AA/AB	128 Mbytes	11	9
Model 610	**66AMA-AA/AB**	64 Mbytes	11	9
	66AMC-AA/AB	128 Mbytes	11	9

Step 2—Memory/CPU Options

Select additional memory if required. All models can be expanded to a maximum of 512 Mbytes. Refer to the following table for recommended minimum memory configurations.

VAX 6000	Vectors	Recommended Minimum Interleave*	Recommended Minimum Memory
Model 510/610	—	1	64 Mbytes
Model 510	One	1	64 Mbytes

*See VAX 6000 Memory in Chapter 5, *VAXcluster Options/Systems Expansion*, for interleave description.

MS65A-BA	32 Mbytes of memory; requires one XMI slot, factory or field installed
DL-MS65A-CA	64 Mbytes of memory, requires one XMI slot, factory installed **only**
MS65A-CA	64 Mbytes of memory; requires one XMI slot, factory or field installed
DL-MS65A-DA	128 Mbytes of memory, requires one XMI slot, factory installed **only**
MS65A-DA	128 Mbytes of memory; requires one XMI slot, factory or field installed
H7236-A	Memory battery backup, maximum one per system
FV64A-AA	Vector processor, maximum one per Model 510. Requires one XMI slot. **Note:** Not supported on Model 600 systems.

Step 5b—External Storage *(Continued)*

Tape and Optical Drives

TF85-TA	**2.6-Gbyte tabletop cartridge tape subsystem.**
TF857-AA/AB	**18.2-Gbyte cartridge tape drive.** Maximum two per SF200/SF210 storage array, one per SF100 storage pedestal. See TF857 description in Chapter 7. **Note:** See Tx800 family in Chapter 7 for more information.
TA91/TA79/TA81	**TA91 tape drive.** Maximum two masters per HSC5X-DA; two masters per KDM70. Each master supports three additional slave units; cables included. **TA79/TA81 tape drives.** Maximum four per HSC5X-DA, two per KDM70; cables included. Supports up to three TU79 add-on units. See descriptions in Chapter 7.
TU81E-BA/BB	**TU81 tape drive.** Maximum four TU81-Plus tapes/RBV20/RBV60 masters per VAXBI channel; four TU81-Plus tapes per system (cables included). Requires DWMBB-xx VAXBI expansion option and one VAXBI slot. See TU81-Plus description in Chapter 7.
RV20/RV64 Optical Drives	Maximum four RBV60/RBV20 masters/TU81-Plus tape drives per VAXBI channel. Maximum three RV60 slaves per master. Requires DWMBB-xx VAXBI expansion option and one VAXBI slot. See RV20/RV64 description in Chapter 7.

Step 6—CI VAXcluster Options

For CI VAXcluster configurations, select appropriate VAXcluster options. CI controller, BNCIA cables, and VAXcluster Software license required.

HSS90-GA/GB **HSS60-GA/GB**	**HSC90/HSC60 VAXcluster starter package.** Includes HSC90-AA/AB or HSC60-AA/AB, one BNCIA-20 cable set, one HSC5X-DA disk/tape data channel, one HSC9X-FA eight-port data channel, and one SC008-AC Star Coupler.
HSC90-BA	**HSC90 storage controller.** Supports four HSC5X-DA and four HSC9X-FA data channel cards for a total of 48 ports; BNCIA-xx cable set required.
HSC60-BA	**HSC60 storage controller.** Supports one HSC5X-DA and two HSC9X-FA data channel cards for a total of 20 ports; BNCIA-xx cable set required.
BNCIA-xx	**Computer interconnect cable sets.** Choose required length 10, 20 or 45 meters (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).
HSC5X-DA	**Disk/tape channel.** Supports four DSA disk drives or tape drives. (Disks and tapes cannot be combined on the same HSC5X-DA.)
HSC9X-FA **SC008-AC**	**Disk data channel.** Supports up to eight DSA disk drives. **8-Port Star Coupler.** Maximum four Star Couplers per system.
SC008-AD	**Star Coupler.** Upgrades SC008-AC to 16 ports; maximum one per SC008-AC.
CISCE-AA	**Star Coupler expander.** Upgrade to either 24 or 32 ports. Requires two SC008-ACs and two SC008-ADs for 32 ports; requires two SC008-ACs and one SC008-AD for 24 ports. Maximum 32 ports per Star Coupler.
VAXcluster Console System	The VCS connects to the console ports of each VAXcluster node to provide a single, central point of control for all clusterwide console functions. Refer to Chapter 5, *VAXcluster Options/Systems Expansion*, for details.

Step 7—Networks and Communications

DEMNA 802.3/Ethernet controller included with each system. Select additional devices if required. **Note:** Connection of system to Ethernet requires an Ethernet transceiver cable, which can be connected to a DESTA, H4005, or port on a DELNI. See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for details.

LAN Communications Controllers

DEMNA-M	**802.3/Ethernet controller;** one included; maximum six Ethernet controllers per system (see further limitations in chart below). Requires one I/O capable XMI slot.
CK-DEMNA-KD	**DEMNA cabinet kit,** required with DEMNA-M.
DEBNI-M	**802.3/Ethernet controller;** maximum six Ethernet controllers per system; four per VAXBI channel (see further limitations in chart below). Requires DWMBB-xx VAXBI expansion option and one VAXBI slot.
CK-DEBNA-LD	**DEBNI cabinet kit,** required with DEBNI-M if placed on internal VAXBI channel.
CK-DEBNA-LJ	**DEBNI cabinet kit,** required with DEBNI-M if placed on external VAXBI channel.

Ethernet Configuration Limitations

Note: The VAX 6000 supports a maximum of six Ethernet controllers (any combination of XMI and VAXBI controllers). The number of direct connections to ThinWire (DESTA) or standard (H4005) transceivers is limited to the number of internally supported transceiver power connections—presently three or less depending on the configuration (see table below). If required, additional ThinWire or standard connections can be provided via the DELNI Ethernet concentrator.

H4005/DESTA Limitations		Number of Connections per System	
VAX 6000 Systems	**Cabinet**	**XMI Only**	**XMI and VAXBI**
Model 500/600	H9657-Cx cabinet	2	3
Model 300/400	H9657-Cx cabinet	1	2
Model 200/300/400	Original cabinet	N/A	3

DEC FDDIcontroller 400

DEMFA-AA	**DEC FDDIcontroller 400, XMI-to-FDDI adapter;** requires one XMI slot. Maximum two per system.

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC-type connection, e.g., BC16M cable or thick wire 15-pin AUI transceiver cable, e.g., BNE3x is required. Additional items are also required—see descriptions in Chapter 6, *Networks, Communications, and Cables*, for ordering information.

DECserver 90L+, 90TL, 700, 250, and MUXserver 300, 310, 320, 380 Terminal and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources such as backplane slots.

DEC WANrouter 250, 500; DECNIS 500, 600; Proteon 4100+; CNX500 and TransPATH 335, 350 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Host-Based Communications Controllers

Select host-based communications controllers for standalone systems (without LAN connectivity), or for special requirements. Typically, Local and Wide Area Communications Servers are preferred.

DMB32/DHB32 Controllers

Total of two DMB32s/DHB32s per CPU cabinet; maximum four per external VAXBI channel. Total of eight DMB32s/DHB32s per system; requires DWMBB-xx VAXBI expansion option. DMB32 requires one VAXBI slot; DHB32 requires one VAXBI slot. See Chapter 6, *Networks, Communications, and Cables*, for details. Additional items may be required.

Step 7—Networks and Communications *(Continued)*

DMB32-M	Eight-line multifunction communications/printer controller.
CK-DMB32-LJ	DMB32 cabinet kit, required with DMB32-M.
DHB32-M	16-line asynchronous communications controller.
CK-DHB32-AJ	DHB32 cabinet kit, required with DHB32-M for EIA-232 connection.
CK-DHB32-LJ	DHB32 cabinet kit, required with DHB32-M for DEC-423 connection.

DSB32 (WANcontroller 220)

Total of four per CPU cabinet; maximum four per external VAXBI channel; eight per system. Requires DWMBB-xx VAXBI expansion option and one VAXBI slot. See Chapter 6, *Networks, Communications, and Cables*, for details.

DSB32-M	Two-line synchronous controller.
CK-DSB32-UJ	DSB32 cabinet kits, required with DSB32-M if placed on internal VAXBI channels.
CK-DSB32-UM	DSB32 cabinet kits, required with DSB32-M if placed on external VAXBI channels.

Network Connectivity Products

See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for details.

Step 8—Console Terminal

A console terminal/printer is required unless otherwise available. VT420-SA/SE, LA75S-AA/AE, and LAXXS-AD included with preconfigured systems. See Chapter 8, *Terminals and Printers*, for ordering information.

DL-VT420-xx	**VT420 terminal**. See VT420 description for ordering details.
LA75S-xx	**LA75 Plus printer**. See LA75 description for ordering details.
LAXXS-AD	**VT420/LA75 table** for both VT420 and LA75.

Step 9—System Printers

Select system printers as required. Line printers must connect to an asynchronous line, DMB32 printer port or DECserver 250 printer server. Printer servers must connect directly to the Ethernet. See Chapter 8, *Terminals and Printers*, for ordering information.

Step 10—Terminals and Printers

Select terminals as required. See Chapter 8, *Terminals and Printers*, for ordering information.

Step 11—Expansion

The 14-slot XMI included with all models. Space for one 11-slot VAXBI channel available in CPU cabinet. Maximum five VAXBI channels (one internal and four external) for all models. See Step 14 and XMI and VAXBI configuring information on page 1.102.

DWMBB-DA	Internal 11-slot VAXBI channel, maximum one per system. Requires one I/O capable XMI slot.
DWMBB-BA/BB	Adds first external VAXBI channel; maximum one per system. Includes H9657-EC/ED VAXBI expansion cabinet which provides five VAXBI slots and 52 panel units and space for additional channels/slots. Requires one I/O capable XMI slot. Battery backup support is not available.
DWMBB-CA	Adds additional VAXBI channels; maximum three per system. Includes H9657-EU VAXBI expansion kit. Provides five VAXBI slots. Requires DWMBB-BA/BB first external VAXBI channel. Requires one I/O capable XMI slot.
DWMVA	VME adapter; see description in VAX 6000 Expansion in this chapter.

Step 12—Software

	Model	ClusterWide License Ratings	Software Processor Code
VAX 6000	Model 510	900	4
VAX 6000	Model 610	1200	D

OpenVMS User Licenses

QL-XULA9-BB	OpenVMS/VAX interactive one-user license
QL-XULA9-BC	OpenVMS/VAX interactive two-user license
QL-XULA9-BD	OpenVMS/VAX interactive four-user license
QL-XULA9-BE	OpenVMS/VAX interactive eight-user license
QL-XULA9-BF	OpenVMS/VAX interactive 16-user license
QL-XULA9-BG	OpenVMS/VAX interactive 32-user license
QL-XULA9-BH	OpenVMS/VAX interactive 64-user license
QL-XULAA-BR	OpenVMS/VAX interactive 128-user license
QL-XULAA-BR	OpenVMS/VAX interactive 256-user license
QL-XULA4-6A	Model 510 OpenVMS/VAX interactive unlimited-use license
QL-XULAD-6B	Model 610 OpenVMS/VAX interactive unlimited-use license
QA-001AA-Hx	OpenVMS media and extended documentation, including VAXcluster and DECnet documentation
QA-09SAA-Hx	OpenVMS media and base documentation
QL-VBRA*-AA	VAXcluster Software license; * = processor code
QA-358AA-Hx	Rdb Runtime media and documentation
QA-GXXAA-Hx	VMS POSIX media and documentation (with IEEE documentation) TK50, magtape
QA-GXXAB-Hx	VMS POSIX media and documentation (without IEEE documentation) TK50, magtape
	Note: x denotes media type: 5 = TK50; 8 = CD-ROM

Select the appropriate NAS software level. See description of NAS packages on page 9.2. **Note:** The NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit
QL-MC2A*-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit
QL-MC5A*-AA	NAS 400 (Network Application Support 400)
QA-MC5AA-Hx	NAS 400 media and documentation kit
	Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape * denotes processor code.

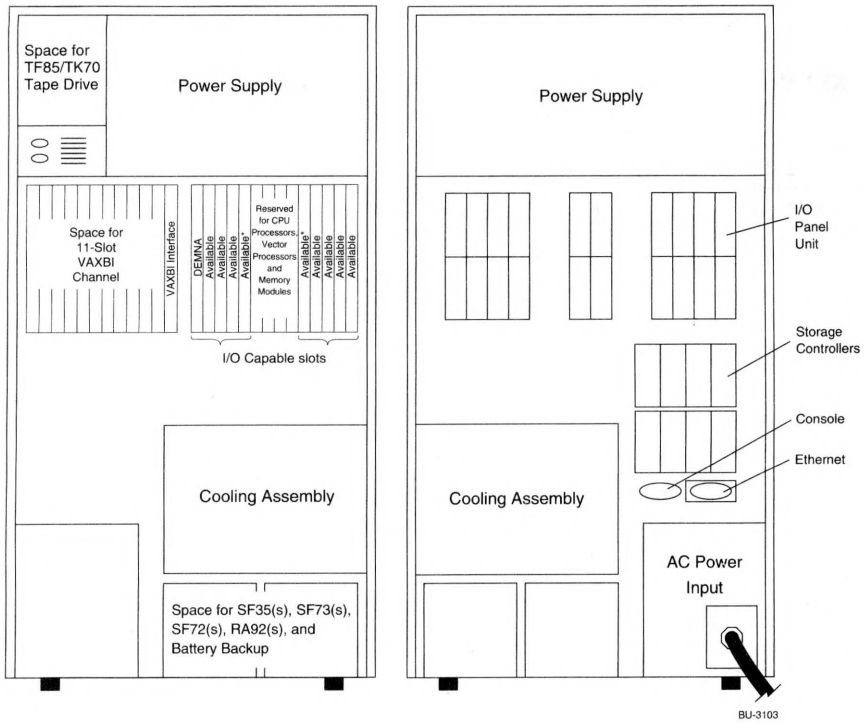
Step 13—Environmental Products

Select environmental power products if required. Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* and *Digital's Environmental Power Products Catalog* (EB-M4442-79).

Step 14—Configuring Information

Before adding XMI and VAXBI options to the system, determine the available mounting space; see XMI and VAXBI Options—Configuring Information on page 1.102.

VAX 6000 OpenVMS System Diagrams



* Not I/O capable for VAX 6000 Model 310 and 410

VAX 6000 System (Front)

VAX 6000 System (Back)

XMI Configuring Information

Note: Power values need not be a consideration.

Option	XMI Slots	I/O Panel Units	General Configuring Rules
CPU modules			
CPU processor	1 XMI slot	0	Maximum six per system
Memory	1 XMI slot	0	Maximum 512 Mbytes per system
Vector processor	1 XMI slot	0	Maximum one per Model 410/510; two per Model 420/520; three per Model 530; four per Model 540
I/O modules (require I/O capable slots)			
CIXCD	1 XMI slot	2	Maximum four per system; CIXCDs and CIBCAs cannot be configured in the same system
DEMFA	1 XMI slot	2	Maximum two per system
DEMNA*	1 XMI slot	1	Maximum six Ethernet controllers per system
KDM70	2 XMI slots	4	Maximum three per system
KFMSA	1 XMI slot	2	Maximum six per system
DWMBB	1 XMI slot	0	Maximum five per system
DWMVA	1 XMI slot	1	Maximum two per system

*See Ethernet Configuration Limitations in Step 7.

Note: The total number of XMI modules cannot exceed 14. See menus for more specific rules.

VAXBI Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					I/O Panel Units	General Configuring Rules
		5 V	12 V	−12 V	−5.2 V	−2 V		
CIBCA	2 VAXBI slots	9.00	0.00	0.00	2.00	1.00	2	Maximum four per system; CIXCDs and CIBCAs cannot be configured in the same system.
DEBNI*	1 VAXBI slot	6.72	0.00	0.00	0.00	0.00	1	Maximum four per VAXBI channel; six Ethernet controllers per system.
DHB32 (EIA-232)	1 VAXBI slot	5.56	0.42	0.42	0.00	0.00	8	Maximum two per CPU cabinet; four per external VAXBI channel. Total of eight per system.
DHB32 (DEC-423)	1 VAXBI slot	5.56	0.42	0.42	0.00	0.00	4	
DMB32	1 VAXBI slot	6.75	0.29	0.42	0.00	0.00	4	
DRB32-M	1 VAXBI slot	8.00	0.00	0.00	0.00	0.00	0	Maximum two per VAXBI channel; eight per system. See DRB32 description in Chapter 7.
DRB32-E	2 VAXBI slots	9.80	0.00	0.00	0.00	0.00	2	
DRB32-W	2 VAXBI slots	11.80	0.00	0.00	0.00	0.00	0	
DSB32	1 VAXBI slot	4.50	0.08	0.08	0.00	0.00	2	Maximum four per CPU cabinet; four per external VAXBI channel. Total of eight per system.
KDB50	2 VAXBI slots	11.94	0.03	0.00	3.76	0.14	2	Maximum four per VAXBI channel; 12 per system.
TU81-Plus RBV20/60 (KLESI)	1 VAXBI slot	7.00	0.00	0.00	0.00	0.00	0	Maximum four per VAXBI channel—total of four tapes per system.
TBK70-CA	1 VAXBI slot	5.50	0.00	0.00	0.00	0.00	0	Maximum one per system.

*See Ethernet Configuration Limitations in Step 7.

Note: See ordering menus for more specific rules.

Step 1—Systems

Select system. The following items are required for base systems/servers—memory, KDM70 or CIXCD, system disk device, console terminal; a TK70 load device is included. For optimum backup performance, a high-capacity tape drive is recommended.

VAX 6000 ULTRIX Base Systems include

- 14-slot XMI system bus
- 11-slot VAXBI channel
- DEMNA 802.3/Ethernet communications interface
- TK70 tape drive and interface
- Console cable
- ULTRIX 2-user base license
- 64-user license
- DECnet-ULTRIX license
- One full-year product warranty (standard warranty recommended)

Note: BE = 60 Hz, 208 V
BJ = 50 Hz, 380/416 V

65AMB-BE/BJ Model 510

VAXserver 6000 ULTRIX Base Systems include

- 14-slot XMI system bus
- 11-slot VAXBI channel
- DEMNA 802.3/Ethernet communications interface
- TK70 tape drive and interface
- Console cable
- ULTRIX 2-user base license
- ULTRIX Server license
- DECnet-ULTRIX license
- One full-year product warranty (standard warranty recommended)

Note: BE = 60 Hz, 208 V
BJ = 50 Hz, 380/416 V

65APB-BE/BJ Model 510

Step 2—Memory

Base systems require memory selection. All models can be expanded to a maximum of 512 Mbytes. Refer to the following table for recommended minimum memory configurations.

VAX 6000 System	Vectors	Recommended Minimum Interleave*	Recommended Minimum Memory
Model 510	—	1	64 Mbytes
Model 510	One	1	64 Mbytes

*See VAX 6000 Memory in Chapter 5, *VAXcluster Options/Systems Expansion*, for interleave description.

MS65A-BA	32 Mbytes of memory, requires one XMI slot
MS65A-CA	64 Mbytes of memory, requires one XMI slot
MS65A-DA	128 Mbytes of memory, requires one XMI slot
FV64A-AA	Vector processor; maximum one per Model 510, two per Model 520

Step 3—Storage Controller/CI Controller

Base systems require the selection of a storage controller or CI controller.

KDM70-AA	**XMI Disk/tape controller.** Maximum one per system; requires two I/O capable XMI slots. Provides eight ports for DSA devices—any two available for tapes.
CK-KDM00-LF	0.9-m (3-ft) KDM70 cabinet kit; required with each KDM70-AA
KDB50-C	**VAXBI disk controller.** Maximum two per VAXBI channel, 12 per system; maximum four disk drives per KDB50. Requires two VAXBI slots.
CIXCD-AB	**CIXCD controller (for expanded disk capability).** Maximum one CIXCD controller per Model 310/410 system—two per Model 5xx systems; requires one I/O capable XMI slot. Requires one BNCIA cable set to connect system to Star Coupler.
BNCIA-xx	**Computer interconnect cable sets.** Choose required length 10, 20 or 45 meters (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).

Step 4—Storage

Select additional storage devices as required. A system device is required for a fully supported system. See Chapter 7, *Storage Devices*, for complete ordering information.

Step 4a—Internal Storage

The CPU cabinet provides space for two SA70 building blocks (8 RA70s), two RA92 disk drives, or one of each. CI connection kit required only if connecting internal storage options to an HSC40 or HSC70. **Note:** One BC26V-xx cable required per disk drive for CI connection.

SA70-MK	**1.1-Gbyte storage array.** Maximum two SA70-MKs, two RA92-PAs, or one of each per CPU cabinet; includes BA27 box, four RA70 disks, and cable.
62X34-SA	**Connection kit,** required for connection of first SA70 internal storage option to external HSC.
62X34-SB	**Connection kit,** required for connection of second SA70 internal storage option to external HSC.
RA92-PA	**1.5-Gbyte disk drive.** Maximum two RA92-PAs, two SA70-MKs, or one of each per CPU cabinet; includes cable.
62X34-RA	**Connection kit,** required for connection of first RA92 internal storage option to external HSC.
62X34-RB	**Connection kit,** required for connection of second RA92 internal storage option to external HSC.

Step 4b—External Storage

RA Disks/ESE50/ Storage Arrays	See RA series disks, storage arrays, and ESE50 descriptions in Chapter 7 for ordering information. Maximum four disk drives per KDB50.
Expanded Disk Capability	For expanded disk capability, select the HSC70 or HSC40 Starter Package. CI connection kit required if connecting internal storage options to an HSC40 or HSC70. **Note:** One BC26V-xx cable required per disk drive for CI connection.
HSS90-GA/GB HSS60-GA/GB	**HSC90/HSC60 VAXcluster starter package,** includes HSC90 or HSC60 storage controller, SC008 Star Coupler, one HSC5x-DA disk/tape channel, one HSC9x-FA data channel, and one set of BNCIA-20 cables.
HSC5X-DA	**HSC5X disk/tape interface,** supports up to four disk drives/tape drives; disks and tapes cannot be combined on the same HSC5X-DA.

Tape/Optical Drives

TA79-BF/BJ	**TA79 tape drive;** maximum four tape units per HSC5X-DA; cables included. Supports three TU79 add-on units.
TA81-AA/AB	**TA81 tape drive;** maximum four tape units per HSC5X-DA; cables included.
TU81E-BA/BB	**TU81-Plus tape drive;** maximum two TU81-Plus tapes/RBV20 masters per VAXBI channel; maximum four TU81-Plus tapes per system (cables included).
RV20 Optical Disk	Maximum two RBV20 masters/TU81-Plus tapes per VAXBI channel. Maximum three RV20 slaves per RBV20 master. See RV20 description in Chapter 7.

Step 5—Networks and Communications

DEMNA 802.3/Ethernet controller included with each system. Select additional devices if required. **Note:** Connection of system to Ethernet requires an Ethernet transceiver cable which can be connected to a DESTA, H4005, or port on a DELNI. See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for complete ordering information.

LAN Communications Controllers

DEMNA-M	**802.3/Ethernet controller;** one included; maximum four Ethernet Controllers per system (see further limitations in chart on following page). Requires one I/O capable XMI slot.
CK-DEMNA-KD	**DEMNA cabinet kit,** required with DEMNA-M.
DEBNI-M	**802.3/Ethernet controller;** maximum two per VAXBI channel (see further limitations in chart on following page). Requires DWMBB-xx VAXBI expansion option and one VAXBI slot.
CK-DEBNA-LD	**DEBNI cabinet kit,** required with DEBNI-M if placed on internal VAXBI channel.
CK-DEBNA-LJ	**DEBNI cabinet kit,** required with DEBNI-M if placed on external VAXBI channels.

Step 5—Networks and Communications *(Continued)*

Ethernet Configuration Limitations

Note: The VAX 6000 supports a maximum of six Ethernet controllers (any combination of XMI and VAXBI controllers). The number of direct connections to ThinWire (DESTA) or standard (H4005) transceivers is limited to the number of internally supported transceiver power connections—presently three or less depending on the configuration (see table below). If required, additional ThinWire or standard connections can be provided via the DELNI Ethernet concentrator.

H4005/DESTA Limitations		Number of Connections per System	
VAX 6000 Systems	**Cabinet**	**XMI Only**	**XMI and VAXBI**
Model 500	H9657-Cx cabinet	2	3
Model 300/400	H9657-Cx cabinet	1	2
Model 200/300/400/500	Original cabinet	N/A	3

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC-type connection, e.g., BC16M cable or thick wire 15-pin AUI transceiver cable, e.g., BNE3x is required. Additional items are also required—see descriptions in Chapter 6, *Networks, Communications, and Cables* for ordering information.

DECserver 90L+, 90TL, 700, 250, and MUXserver 300, 310, 320, 380 Terminal and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources such as backplane slots.

DEC WANrouter 250, 500; DECNIS 500, 600; Proteon 4100+; CNX500 and TransPATH 335, 350 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Host-Based Communications Controllers

Select host-based communications controllers for standalone systems (without LAN connectivity), or for special requirements. Typically, Local and Wide Area Communications Servers are preferred.

DMB32/DHB32 Controllers

Total of two DMB32/DHB32 controllers per CPU cabinet; maximum four per external VAXBI channel. Total of eight DMB32/DHB32 controllers per system. See Chapter 6, *Networks, Communications, and Cables* for details. Additional items may be required.

DMB32-M	8-line multifunction communications/printer controller.
CK-DMB32-LJ	DMB32 cabinet kit, required with DMB32-M.
DHB32-M	16-line asynchronous communications controller.
CK-DHB32-AJ	DHB32 cabinet kit, required with DHB32-M for EIA-232 connection.
CK-DHB32-LJ	DHB32 cabinet kit, required with DHB32-M for DEC-423 connection.

Network Connectivity Products

See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for details

Step 6—Console Terminal

A console terminal/printer is required unless otherwise available. See Chapter 8, *Terminals and Printers*, for complete ordering information.

DL-VT420-xx	**VT420 terminal**. See VT420 description for ordering details.
LA75-xx	**LA75 printer.** See LA75 description for ordering details.
LAXXS-AD	**VT420/LA75** stand for both VT420 and LA75.

Step 7—System Printers

Select system printers as required. Line printers must connect to an asynchronous line, DMB32 printer port, or DECserver 250 Printer Server. Print servers must connect directly to the Ethernet. See Chapter 8, *Terminals and Printers*, for details. See ULTRIX Software Product Description.

Step 8—Terminals and Printers

Select terminals and printers as required. See Chapter 8, *Terminals and Printers*, for ordering information.

Step 9—I/O Expansion

One 14-slot XMI and one 11-slot VAXBI channel included with all models. Maximum five VAXBI channels—one internal, four external. See XMI and VAXBI Configuring Information on following page.

DWMBB-BA/BB	External first VAXBI channel, adds second VAXBI channel; maximum one per system. Includes H9657-EC/ED VAXBI expansion cabinet and H9657-EU VAXBI expansion kit. Provides five VAXBI slots and 52 panel units and space for additional channels/slots. Requires one XMI slot.
DWMBB-CA	Adds additional VAXBI channels; maximum three per system. Includes H9657-EU VAXBI expansion kit. Provides five VAXBI slots. Requires DWMBA-BA/BB third VAXBI channel. Requires one XMI slot.

Step 10—Software

Select media and documentation.

Software Processor Code	VAXserver Model 510 = **G**
QL-VEYAx-B9	ULTRIX 65- to unlimited-user upgrade license.
QA-VEYAB-H5	ULTRIX media (TK50) and documentation. Recommended for first VAX system of each CPU type.
QA-716AA-H5	DECnet-ULTRIX media (TK50) and documentation.

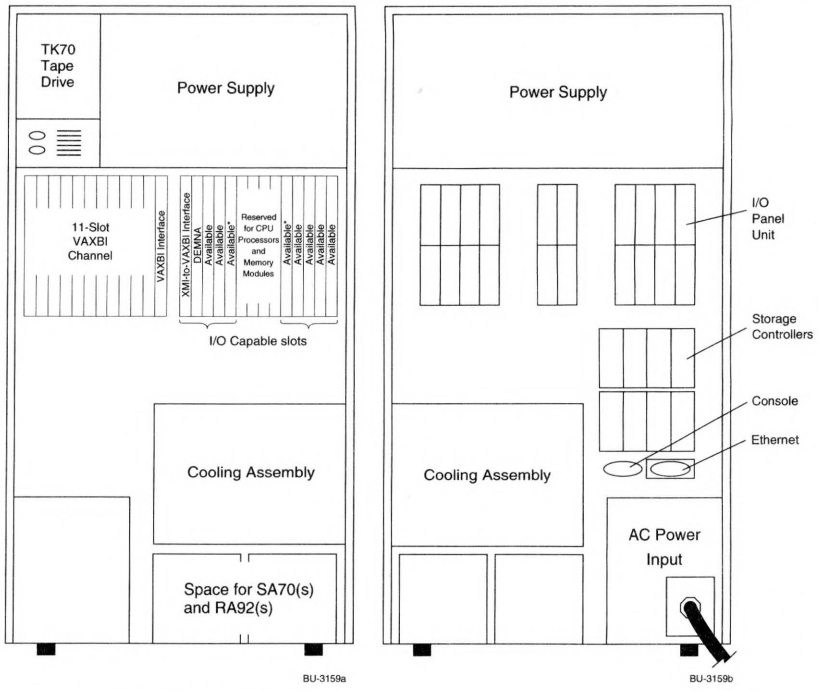
Step 11—Environmental Products

Select environmental power products if required. Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* and *Digital's Environmental Power Products Catalog* (EB-M4442-79).

Step 12—Configuring Information

Before adding VAXBI and XMI options to the system, refer to the following tables; see VAXBI Options—Configuring Information on following page.

VAX 6000 ULTRIX System Diagram



* Not I/O capable for VAX 6000 Model 310 and 410

VAX 6000 System (Front) **VAX 6000 System (Back)**

VAXBI Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V	
CIBCA CI Port	2 VAXBI slots	9.00	0.00	0.00	2.00	1.00	2
DEBNA/DEBNI* Ethernet Port	1 VAXBI slot	6.72	0.00	0.00	0.00	0.00	1
DHB32 (EIA-232)	1 VAXBI slot	5.56	0.42	0.42	0.00	0.00	8
DHB32 (DEC-423)	1 VAXBI slot	5.56	0.42	0.42	0.00	0.00	4
DMB32	1 VAXBI slot	6.75	0.29	0.42	0.00	0.00	4
KDB50	2 VAXBI slots	11.94	0.03	0.00	3.76	0.14	2
TU81-Plus, RBV20/60	1 VAXBI slot	7.00	0.00	0.00	0.00	0.00	1
TBK70-CA	1 VAXBI slot	5.50	0.00	0.00	0.00	0.00	0

* See Ethernet Configuration Limitations in Step 5.

XMI Configuring Information

Note: Power values need not be a consideration.

Option	XMI slots	I/O Panel Units
CPU modules		
CPU processor	1 XMI slot	0
Memory	1 XMI slot	0
Vector processor	1 XMI slot	0
I/O modules (requires I/O capable slots)		
CIXCD	1 XMI slot	2
DEMNA	1 XMI slot	1
KDM70	2 XMI slots	4
XMI-to-VAXBI interface	1 XMI slot	0

Note: Contact local Customer Services for detailed site preparation data.

Physical Characteristics		Operating	Shipping
	Height	154 cm (60.5 in.)	180 cm (71.0 in.)
	Width	78 cm (30.5 in.)	94 cm (37.0 in.)
	Depth	90 cm (36.0 in.)	105 cm (41.5 in.)
	Weight*	318 kg (700 lb)	391 kg (860 lb)

* Does not include in-cabinet storage or optional BBU.

	Clearances	Operating	Service
	Front	1 m (39 in.)	Same
	Rear	1 m (39 in.)	Same
	Sides	None	None

Environmental

Temperature		
	Operating	**VAX 6000-200/300/400/500:** 15° to 32° C (59° to 90° F) with TK70/TF85 10° to 40° C (50° to 104° F) **VAX 6000-600:** 15° to 32° C (59° to 90° F)
	Nonoperating	−40° to 66° C (−40° to 151° F)
Humidity		
	Operating	20% to 80% noncondensing with TK70/TF85 10% to 90% noncondensing
	Nonoperating	10% to 95% noncondensing
Altitude		
	Operating	2438 meters (8000 feet) Nonoperating: 9100 meters (30,000 feet)
Vibration		
	Operating	2–22 Hz @ 0.01"da minimum 22–500 Hz @ 0.25g maximum

Note: Maximum Heat Dissipation (subject to configuration)

Fully configured system	5440 Btu/hr (1600 watts)
Systems without VAXBI	1365 Btu/hr (400 watts)

Electrical

Power Requirements		
Nominal voltage	208 V	380/416 V
Nominal frequency	60 Hz	50 Hz
Frequency range	47–63 Hz	47–63 Hz
Power phasing	Three	Three
RMS current (maximum per phase)	8 amps	4.3/4.0 amps
Surge current	60 amps	60 amps
Power Cord		
Length	4.57 m (15 ft)	4.57 m (15 ft)
Plug	208 V 3-Phase Y HUBBELL #2511 NEMA #L21-20P DEC #12-11209-00	380/416 V 3-Phase Y HUBBELL #16P6W DEC #12-14379-04 516R6W

Expansion Cabinets	Voltage Nominal V	Freq Nominal Hz	Number of Phases	Current ac Amps	Thermal Dissipation Watts	Thermal Dissipation Btu/h [kJ/h]	Receptacle Type	PCS/PDS Cable Type	Physical Size Height in. [cm]	Width in. [cm]	Depth in. [cm]	Weight lb [kg]
H9652-EC	120	50–60	1	Note[1]	Note[1]	Note[1]	L5-30R	BC24S	60.3	26.3	31.5	X+350.0[2]
H9652-ED	120	50–60	1	Note[2]	Note[2]	Note[2]	6-15R	BN29K	[153.0]	[66.7]	[80.0]	[X+158.9[2]]
H9657-EC[3]	208	60	3	11.97	3,001	10,242	L21-20R	BC24V	60.0	30.0	30.0	540.0
H9657-ED[3]	380/416	50	3	5.26	2,955	10,085	516R6W	BN29X	[152.0]	[76.2]	[76.2]	[308.4]

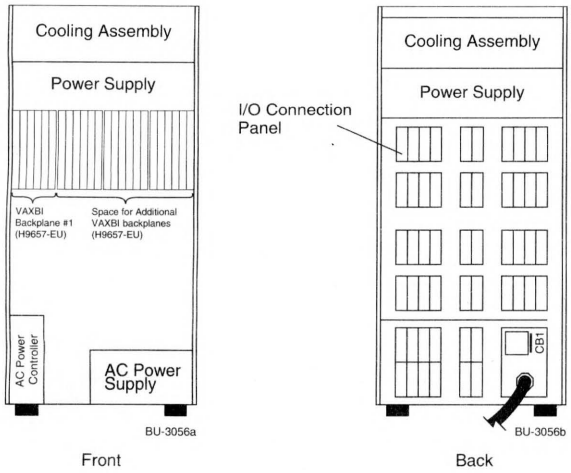
[1] Requirements (cooling, power) of options.
[2] X = Requirements (cooling, power, weight) of options.
[3] All data is for fully configured cabinet.

VAXBI Expansion Options

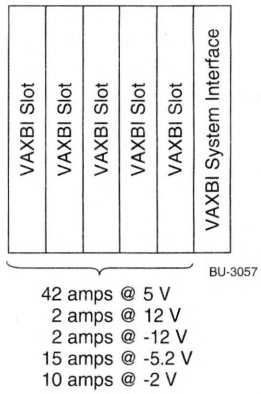
DWMBB-DA Provides internal 11-slot VAXBI channel; maximum one per system. Requires one I/O capable XMI slot.

DWMBB-BA/BB Provides first external VAXBI channel. Includes one H9657-EC/ED VAXBI expansion cabinet, which provides 5 VAXBI slots and 52 panel units and space for additional VAXBI channels. Maximum one per system. Requires one I/O capable slot. Battery backup not supported on systems including DWMBB-BA/BB.

DWMBB-CA Provides additional external VAXBI channels. Includes one H9657-EU VAXBI expansion kit. Provides five VAXBI slots. Requires a DWMBB-BA/BB. Maximum three per system.



DWMBB VAXBI Expansion Options



H9657-EU Expansion Slots

VAX 6000 Systems Battery Backup

H7236-A Memory battery backup for VAX 6000 Model 500/600 and all VAX 6000 Models 300/400 identified by model number H9657-CA/CB on the CPU cabinet serial tag. Powers main memory for approximately 10 minutes. Provides one second ac power ride-through.

H7231-N Memory battery backup for VAX 6000 Model 200/300/400 systems identified by model number 62AMB-YE/YJ, 62AMA-YE/YJ, 63AMB-YE/YJ, and 64AMA-YE/YJ on the CPU cabinet serial tag. Powers main memory for approximately 10 minutes.

VAX 6000 Model 200 Systems TK50-to-TK70 Upgrade

TBK70-UA Upgrades a TK50 console load device to a TK70 console load device for VAX 6000 Model 200 systems.

VAX 6000 Vector Processor

FV64A-AA CMOS implementation 1-Mbyte onboard cache, general-purpose arithmetic unit with four pipes. Peak performance 45 Mflops double precision, 90 Mflops single precision. Maximum one per VAX 6000 Model 410/510 systems; two per Model 420/520 systems; three per Model 530 system; and four per Model 540 system. Requires one XMI slot.

VME Adapter Option

Interface between the VAX 6000 XMI system bus and the VMEbus; two VME buses are supported. It is compliant with IEEE/ANSI 1014-1987, utilizes arbitration modes (PRIORITY, ROUND-ROBIN, SINGLE LEVEL), bus release modes (FAIR, ROR, RWD), data modes (D8, D16, D32 bits), and address modes (A16, A24, A32 bits). The option is available as a module set for customer defined power and packaging or in the optional BA62 VME bus enclosure. The BA62 is a pedestal enclosure that contains six 6U slots and three 9U slots. Slot 1 of the 6U slots must contain the Digital VME interface module. The BA62 contains a power supply that delivers standard VME voltages and has a 470-watt capacity. (Contact EIS sales representative for detailed configuration information.)

DWMVA-AA	VAX 6000 VME adapter option, includes one XMI module and one 6U VME module and a shielded cable assembly (3 meters).
BA62-BA/BB	VME pedestal enclosure.
DWMVA-BA/BB	Includes DWMVA-AA and BA62-BA/BB.

Prerequisite Software

VMS V5.5 for VAX 6000 Model 600 systems and VMS V5.4.3 for VAX 6000 Model 200/300/400/500 systems.

Specifications

Environmental (BA62-BA/BB)

Operating Range	10°–40° C (50°–104° F)
Humidity	10%–90% with maximum wet bulb temperature 28° C (82° F) and minimum dew point 2° C (39° F) noncondensing
Altitude	Up to 8000 feet

Electrical Requirements (BA62-BA/BB)

110–120 Vac/220–240 Vac, single-phase, 3-wire
Input line frequency: 50, 60 Hz
Input power: 700 W maximum
Plug type: 120 V 60 Hz, 240 V 50 Hz (standard wall outlet)

VAX 6000 CPU Upgrades

To upgrade to VAX 6000 Model 500/600 systems, follow the steps listed below. For all other upgrades, select the appropriate upgrade based on the steps that follow.

Step 1 — Select CPU upgrade.
Step 2 — Unless included with upgrade package, replace any MS62A-AB memory with MS65A-xx memory.
Step 3 — If model number of CPU cabinet serial tag is H9657-Cx, Steps 3a and 3b are not required.
Step 3a — If the following items—battery backup, more than 12 XMI slots, or more than four CPUs—are required, order number H9657-CU (power conversion kit).
Step 3b — If the H9657-CU is required and if more than two VAXBI channels are in the system, order one DWMBB-AB for each VAXBI in excess of two.
Step 3c — If battery backup is required, order H7236-A. Replace H7231-N with H7236-A.
Step 4 — If a CIBCA-AA is present, replace with CIXCD-AB or CIBCA-BA.

The following upgrade packages include CPU processor(s), VMS or ULTRIX licenses, and one full-year product warranty; DECnet full function license included unless noted differently with VMS upgrades—DECnet-ULTRIX license included with ULTRIX upgrades.

Model 200

From—To	VMS	ULTRIX
Model 210–610	**66AUA-AA**	
Model 220–610	**66AVA-AA**	
Model 220–620	**66BUA-AA**	
Model 230–630	**66CUA-AA**	
Model 240–640	**66DUA-AA**	
Model 210–610	**66AUE-AA***	
Model 220–610	**66AUF-AA***	
Model 230–610	**66AUH-AA***	
Model 240–610	**66AUJ-AA***	
Model 210–510	**65AUA-AA**	**65AUA-BA**
Model 220–520	**65BUA-AA**	**65BUA-BA**
Model 230–530	**65CUA-AA**	**65CUA-BA**
Model 240–540	**65DUA-AA**	**65DUA-BA**
Model 210–510	**65AUE-AA***	
Model 220–510	**65AUH-AA***	
Model 230–510	**65AUJ-AA***	
Model 240–510	**65AUK-AA***	
Model 210–410	**64AUA-AA**	**64AUA-BA**
Model 220–420	**64BUA-AA**	**64BUA-BA**
Model 230–430	**64CUA-AA**	**64CUA-BA**
Model 240–440	**64DUA-AA**	**64DUA-BA**

Model 300

From—To	VMS	ULTRIX
Model 310–610	**66AUA-AC**	
Model 320–610	**66AVA-AC**	
Model 320–620	**66BUA-AC**	
Model 330–630	**66CUA-AC**	
Model 340–640	**66DUA-AC**	
Model 350–650	**66EUA-AC**	
Model 360–660	**66FUA-AC**	
Model 310–610	**66AUE-AC***	
Model 320–610	**66AUF-AC***	
Model 330–610	**66AUH-AC***	
Model 340–610	**66AUJ-AC***	
Model 350–610	**66AUK-AC***	
Model 360–610	**66AUL-AC***	
Model 310–510	**65AUA-AC**	**65AUA-BC**
Model 320–520	**65BUA-AC**	**65BUA-BC**
Model 330–530	**65CUA-AC**	**65CUA-BC**
Model 340–540	**65DUA-AC**	**65DUA-BC**
Model 350–550	**65EUA-AC**	**65EUA-BC**
Model 360–560	**65FUA-AC**	**65FUA-BC**
Model 310–510	**65AUE-AC***	
Model 320–510	**65AUH-AC***	
Model 310–410	**64AUA-AC**	**64AUA-BC**
Model 320–420	**64BUA-AC**	**64BUA-BC**
Model 330–430	**64CUA-AC**	**64CUA-BC**
Model 340–440	**64DUA-AC**	**64DUA-BC**
Model 350–450	**64EUA-AC**	**64EUA-BC**
Model 360–460	**64FUA-AC**	**64FUA-BC**

* Includes 128 Mbytes (MS65A-DA) of memory.

VAX 6000 CPU Upgrades

Model 400

From—To	VMS	ULTRIX
Model 410–610	66AUA-AF	
Model 420–610	66AVA-AF	
Model 420–620	66BUA-AF	
Model 430–630	66CUA-AF	
Model 440–640	66DUA-AF	
Model 450–650	66EUA-AF	
Model 460–660	66FUA-AF	
Model 410–610	66AUE-AF*	
Model 420–610	66AUF-AF*	
Model 430–610	66AUH-AF*	
Model 440–620	66BUJ-AF*	
Model 450–620	66BUK-AF*	
Model 460–620	66BUL-AF*	
Model 410–510	66AUE-AF*	
Model 410–510	65AUA-AF	65AUA-BF
Model 420–520	65BUA-AF	65BUA-BF
Model 430–530	65CUA-AF	65CUA-BF
Model 440–540	65DUA-AF	65DUA-BF
Model 450–550	65EUA-AF	65EUA-BF
Model 460–560	65FUA-AF	65FUA-BF
Model 410–420	64BUA-AF	64BUA-BF
Model 420–430	64CUA-AF	64CUA-BF
Model 430–440	64DUA-AF	64DUA-BF
Model 440–450	64EUA-AF	64EUA-BF
Model 450–460	64FUA-AF	64FUA-BF

Model 500

From—To	VMS	ULTRIX
Model 510–610	66AUA-AK	
Model 520–620	66BUA-AK	
Model 530–630	66CUA-AK	
Model 540–640	66DUA-AK	
Model 550–650	66EUA-AK	
Model 560–660	66FUA-AK	
Model 510–610	66AUD-AK†	
Model 520–620	66BUD-AK†	
Model 530–630	66CUD-AK†	
Model 540–640	66DUD-AK†	
Model 550–650	66EUD-AK†	
Model 560–660	66FUD-AK†	
Model 510–520	65BUA-AK	65BUA-BK
Model 520–530	65CUA-AK	65CUA-BK
Model 530–540	65DUA-AK	65DUA-BK
Model 540–550	65EUA-AK	65EUA-BK
Model 550–560	65FUA-AK	65FUA-BK
Model 510–520	65BUD-AK†	
Model 520–530	65CUD-AK†	
Model 530–540	65DUD-AK†	
Model 540–550	65EUD-AK†	
Model 550–560	65FUD-AK†	

Model 600

From—To	VMS	ULTRIX
Model 610–620	66BUA-AM	
Model 620–630	66CUA-AM	
Model 630–640	66DUA-AM	
Model 640–650	66EUA-AM	
Model 650–660	66FUA-AM	
Model 610–620	66BUD-AM†	
Model 620–630	66CUD-AM†	
Model 630–640	66DUD-AM†	
Model 640–650	66EUD-AM†	
Model 650–660	66FUD-AM†	

VAXserver 6000 Upgrades

From—To	VMS	ULTRIX
Model 310–610	66KUA-HD	
Model 320–620	66LUA-HD	
Model 310–510	65KUA-HD	65KUA-JD
Model 320–520	65LUA-HD	65LUA-JD
Model 310–410	64KUA-HD	64KUA-BD
Model 320–420	64LUA-HD	64LUA-BD
Model 410–610	66KUA-HH	
Model 420–620	66LUA-HH	
Model 410–510	65KUA-HH	65KUA-JH
Model 420–520	65LUA-HH	65LUA-JH
Model 410–420	64LUA-HH	64LUA-BD
Model 510–610	66KUA-HL	
Model 520–620	66LUA-HL	
Model 510–520	65LUA-HL	65LUA-JL
Model 610–620	66LUA-HN	
Model 620–630	66MUA-HN	
Model 630–640	66NUA-HN	

VAXserver 6000 to VAX 6000 Conversion Kits

From—To	VMS	ULTRIX
Model 410–410	64AUA-AH	64AUA-BH
Model 420–420	64BUA-AH	64BUA-BH
Model 510–510	65AUA-AL	65AUA-BL
Model 520–520	65BUA-AL	65BUA-BL
Model 610–610	66AUA-AN	
Model 620–620	66BUA-AN	
Model 630–630	66CUA-AN	

* Includes 128 Mbytes (MS65A-DA) of memory.

† Includes OpenVMS Base license (DECnet not included)

VAX 6000 Series Rack-mountable Systems

Product Description

VAX 6000 series systems are available in custom-quoted rack-mountable configurations that provide all the functionality of the standard 76.2-cm-wide (30-in.-wide) system in a 48.2-cm-wide (19-in.-wide), EIA standard rack-mountable format. These systems require 40 cm (15.75 in.) of vertical mounting space, making them ideal for applications where severe footprint or environmental constraints exist. Since they can be installed in air-conditioned, NEMA enclosures, the VAX 6000 series rack-mount systems can be placed in areas where excessive heat, non-corrosive liquids, dirt, dust, and other contaminants might cause standard systems to fail.

Rack-mountable VAX 6000 series base systems consist of a single 14-slot XMI chassis that requires a software load device and any other options required for standard configurations. They support the same models and allow the same expansion capabilities. A 12-slot VAXBI chassis is optional and can include a TK70 tape drive within the chassis. Each chassis has an integral power supply and two fans that provide front-to-back forced air cooling.

The rack-mountable VAX 6000 series systems use a modular power supply that requires an ac input power cord. This power supply does not support the Battery Backup option for VAX 6000 series products. In applications requiring battery backup, an HA32A Uninterruptible Power System is recommended. To ensure FCC compliance, the rack-mountable VAX 6000 series chassis must be mounted in a standard EMI shielded cabinet.

Specifications

Power Requirements

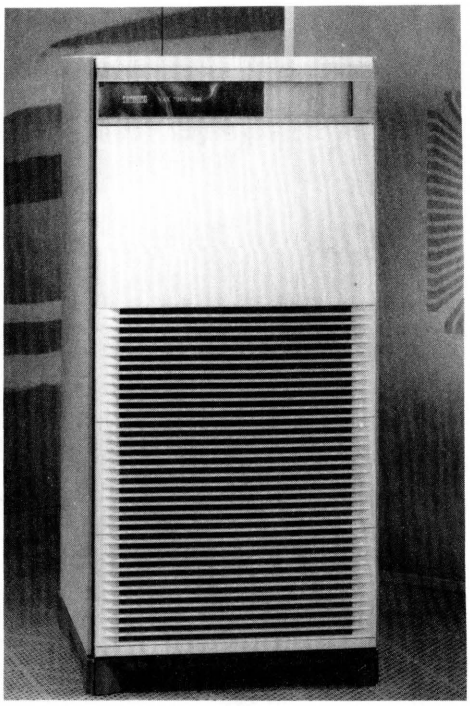
Input voltage	220–240 Vrms (50/60 Hz)
Frequency tolerance	47–63 Hz
Phases	1
Surge current	61 A
Maximum ac power	1.6 kW consumption/system

Physical Characteristics Per Chassis

Height	40.0 cm (15.75 in.); includes cable management
Width	48.3 cm (19. in.); typical cabinet width is 21.5 inches
Depth	71.1 cm (28. in.); recommended cabinet depth is 36 inches
Weight	59.1 kg (130 lb)

Note: For a custom quotation and more information contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

VAX 7000 Systems and Servers



Product Description

VAX 7000 systems are the latest in a family of OpenVMS-based systems designed for the rigorous demands of data center computing. The VAX 7000 system's modular platform enables users to improve performance in a number of different dimensions—symmetric multiprocessing, larger memory, more I/O bandwidth, greater disk capacity, and VAXcluster systems—all the while building upon current investments.

VAX 7000 systems support thousands of applications for a wide range of industries. Travel reservation, telephone switching, information-rich imaging, high-value funds transfer, and compute-intensive financial or pharmaceutical modeling applications are only a few examples of the kinds of mission-critical applications that the VAX 7000 runs exceedingly well. The system supports massive databases, multiple CPUs acting in concert, and high-volume I/O.

In addition, VAX 7000 servers support hundreds of PCs or workstations running a wide range of applications. Because Digital's client/server computing is built on standards-based Network Application Support (NAS) software, VAX 7000 servers support OpenVMS, ULTRIX, UNIX, MS-DOS, OS/2, and Macintosh clients, and both windowing and ASCII terminals.

With as many as four CPUs in a symmetric multiprocessing (SMP) configuration and up to 400 Mbytes/second of I/O, a single VAX 7000 system offers the powerful features needed in data center systems. And multiple systems provide even more: VAX 7000 systems in VAXcluster configurations provide support for as much as 10 terabytes of data.

To balance the performance of the four processors, the VAX 7000 has been designed to support very high-volume I/O. A high-speed system interconnect links memory and processors, allowing a transfer rate of 640 Mbytes/second. For peripheral devices, the VAX 7000 system supports as many as four 100-Mbyte/second XMI buses, for an aggregate bandwidth of 400 Mbytes/second. And since many of Digital's XMI-based I/O controllers are powered by RISC chips, high system throughput is bolstered at every point.

Product Description *(Continued)*

The CPU technology is based upon Digital's proven high reliability CMOS technology. Full error protection is provided on the system bus, on all memory modules, and on the write-back cache. The power system provides power conditioning to protect against high-voltage transients.

VAX 7000 systems get their fast processing power from a design that takes VAX instructions, translates them into RISC operations, and then executes them in a very high-performance, four-stage RISC pipeline. The powerful CPU runs at 91 MHz. The ability to configure a symmetric multiprocessing VAX 7000 with as many as four CPUs offers yet another dimension of performance.

An optional N+1 redundant power system allows for higher system availability in the event of a power regulator failure. Systems can be configured with up to three power regulators, assuring that even the most heavily configured systems have sufficient redundant power to keep operating in the event of a single power regulator failure. Optional system-level UPS (Uninterruptible Power System) capability is available to support all elements within the CPU and I/O expansion cabinets. This means that CPU, memory, I/O channels and devices, and in-cabinet disk storage can continue operating in the event of a power loss.

The VAX 7000 systems provide both balanced performance and outstanding configuration flexibility. Up to seven memory arrays, and up to four XMI I/O channels allow users to configure large systems to suit a wide variety of needs. The CPU, memory, and I/O can all be upgraded over time with future generations of components, providing excellent investment protection.

VAX 7000 systems support up to 512 Mbytes of memory today, with planned support for up to 3.5 Gbytes of memory at the next major release of the OpenVMS operating system. VAX 7000 systems can support more than 10 terabytes of disk storage in a VAXcluster configuration—easily enough capacity for the largest datacenter applications.

The balanced I/O subsystem on the new VAX 7000 provides substantial I/O capacity initially (one 12-slot XMI I/O channel is standard) and the ability to add up to three more 12-slot XMI I/O channels. These XMI I/O channels offer a bandwidth of 100 Mbytes/second each, making this system capable of providing very high I/O bandwidth performance—up to 400 Mbytes/second.

XMI devices supported include adapters for Ethernet, CI, FDDI, SDI/STI, and DSSI interconnects. Support for up to 16 Ethernet adapters, 10 CI adapters, 12 DSSI adapters (24 ports), 24 SDI/STI adapters (24 ports), and eight FDDI adapters demonstrates the large expansion potential of the new VAX 7000 systems.

Adding a VAX 7000 system to a VAXcluster configuration enables efficient, economical resource sharing, plus still higher availability and storage capacities.

An entry-level Digital Storage Systems Interconnect (DSSI) VAXcluster system offers increased system uptime and availability—if one system goes down, as many as three other systems can continue processing critical data.

When more systems and storage are needed, a CI-based VAXcluster system offers even greater flexibility and superior system, application, and data availability. There's no disruption to users when the cluster grows—new systems, or disk and tape subsystems can be added without taking the cluster offline.

The high-speed FDDI network allows connection of VAXcluster systems in separate geographic locations many kilometers apart. If disaster tolerance is a requirement, a VAXcluster can be duplicated at another site. Then, if one site goes down due to a fire, flood, or power outage, the other site can continue operations. OpenVMS Volume Shadowing ensures full availability of critical data at the other site.

Product Description *(Continued)*

Up to 24 Gbytes of storage and 2.6 Gbytes of tape capacity can be configured in the VAX 7000 system cabinet to form a complete, compact system where space requirements are critical. Outside the cabinet, industry-leading DSSI storage arrays such as the DECarray 400 offer economical, high-capacity storage solutions.

A variety of tape drives can meet all needs, from backup and data interchange to high-capacity, high-performance storage. For example, VAX 7000 systems support Digital's TA867/TF867 tape drives, each drive providing unattended backup capacity of up to 42 Gbytes.

Digital's OpenVMS operating system is based on standards—standards for software development, networking and communications, system management, data management, and user interaction. With standards, OpenVMS brings superior functionality to an open system. Openness gives users options, makes it easier to move between platforms, and lets users of other vendors' systems take advantage of the special features of the OpenVMS operating system. OpenVMS standards include IEEE POSIX, X/Open Base Branding (XPG3) and Motif, and Digital is committed to supporting the Open Software Foundation's (OSF) Distributed Computing Environment (DCE).

Digital's commitment to Network Application Support (NAS) and standards-based open computing means that users can integrate and share applications over a network and across a broad range of industry-standard, heterogeneous systems. VAX 7000 systems offer a complete range of datacenter solutions built upon NAS software to provide the exact level of functionality needed.

A variety of configurations are available. VAX 7000 ADVANTAGE-SERVER systems offer package-priced, balanced configurations—complete with memory, I/O controllers, disks, and tape—with the flexibility to add components, such as user licensing, as needed. Single-node ADVANTAGE-SERVER systems include OpenVMS and the NAS 300 software package, providing complete support for client/server computing. VAXcluster ADVANTAGE-SERVER systems include NAS 400 software, which provides high-performance and high-availability datacenter features.

Traditional VAX 7000 systems are designed to be integrated into existing VAXcluster configurations. They include unlimited OpenVMS user license, DECnet full-function license, and an Rdb/OpenVMS runtime license.

Base servers are the VAX 7000 configurations of choice when configuration flexibility is the primary consideration. VAX 7000 base servers allow users to add user licenses, memory, I/O controllers, storage, database software, and networking support as the data center requires. VAX 7000 base servers include the OpenVMS operating system. NAS software, DECnet or TCP/IP, PATHWORKS, and Rdb/OpenVMS are key options.

Step 1—Systems

Unless included with preconfigured system, the following items are required. OpenVMS user licenses may be ordered as needed.

- InfoServer 100/150 for initial booting of system console
- CIXCD (CI) controller, KFMSA (DSSI) disk/tape adapter, KDM70 (SDI/STI) disk/tape controller
- System disk device
- Console terminal
- VAXcluster Software license for each system when multiple systems are used in a VAXcluster environment

Additional items may be added as required.

ADVANTAGE-SERVER Systems include

- CPU(s), high-speed system interconnect bus, 12-slot XMI I/O channel
- 64, 128 or 256 Mbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- KFMSA disk/tape adapter
- RF73 2.0-Gbyte disk drives with cables and disk plug-in unit
- TF85 2.6-Gbyte cartridge tape drive
- VT420 console terminal and cable*
- LA75 Plus console printer and cable
- VT420/LA75 table
- 48-volt power regulator
- OpenVMS base license (with POSIX)
- NAS 300 package (with DECnet end-node license and Rdb Runtime license)
- One full-year product warranty (standard warranty recommended)

* Not included with Japan order numbers

Order Number xK = 60 Hz, 208 V xL = 50 Hz, 380/416 V xM = 50/60 Hz, Japan	Model	Memory	RF73 (2.0 Gbytes)
SV-7F1DA-AK/AL/AM	Model 610	64 Mbytes	2 × RF73
SV-7F2DA-AK/AL/AM	Model 610	128 Mbytes	2 × RF73
SV-7F2DA-BK/BL/BM	Model 620	128 Mbytes	2 × RF73
SV-7F3DA-CK/CL/CM	Model 630	256 Mbytes	4 × RF73
SV-7F3DA-DK/DL/DM	Model 640	256 Mbytes	4 × RF73

ADVANTAGE-SERVER DSSI VAXcluster Systems include

- VAX 7000 systems with CPU(s), high-speed system interconnect bus and 12-slot XMI I/O channel
- 128 Mbytes of memory per system
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller per system
- KFMSA disk/tape adapter per system
- DECarray SF400 (four RF73 2.0-Gbyte disk drives and TF857 18.2-Gbyte cartridge tape subsystem)
- VT420 console terminal and cable per system*
- LA75 Plus console printer and cable per system
- VT420/LA75 table per system
- 48-volt power regulator per system
- OpenVMS base license (with POSIX) per system
- NAS 400 package per system (with DECnet full-function license, VAXcluster license, and Rdb Runtime license)
- One full-year product warranty (standard warranty recommended)

* Not included with Japan order numbers

Order Number xK = 60 Hz, 208 V xL = 50 Hz, 380/416 V xM = 50/60 Hz, Japan	Configuration	RF73 (2.0 Gbytes)
DV-7F2DA-EK/EL/EM	2 × VAX 7000-610	4 × RF73
DV-7F2DA-KK/KL/KM	3 × VAX 7000-610	6 × RF73

Step 1—Systems *(Continued)*

OpenVMS Traditional Systems include

- CPU(s), high-speed system interconnect bus and 12-slot XMI I/O channel
- 128, 256, or 512 Mbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- 48-volt power regulator
- Console cable
- OpenVMS Unlimited-Use license (with POSIX)
- DECnet Full-Function license
- Rdb Runtime license
- One full-year product warranty (standard warranty recommended)

Order Number xA = 60 Hz, 208 V xB = 50 Hz, 380/416 V xC = 50/60 Hz, Japan	Model	Memory
7FAMC-AA/AB/AC	Model 610	128 Mbytes
7FAMD-AA/AB/AC	Model 610	256 Mbytes
7FAME-AA/AB/AC	Model 610	512 Mbytes
7FBMC-AA/AB/AC	Model 620	128 Mbytes
7FBMD-AA/AB/AC	Model 620	256 Mbytes
7FBME-AA/AB/AC	Model 620	512 Mbytes
7FCMD-AA/AB/AC	Model 630	256 Mbytes
7FCME-AA/AB/AC	Model 630	512 Mbytes
7FDMD-AA/AB/AC	Model 640	256 Mbytes
7FDME-AA/AB/AC	Model 640	512 Mbytes

OpenVMS Base Servers include

- CPU(s), system interconnect bus and 12-slot XMI I/O channel
- 64, 128 or 256 Mbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- 48-volt power regulator
- Console cable
- OpenVMS base license (with POSIX)
- One full-year product warranty (standard warranty recommended)

Order Number xA = 60 Hz, 208 V xB = 50 Hz, 380/416 V xC = 50/60 Hz, Japan	Model	Memory
7FAMB-BA/BB/BC	Model 610	64 Mbytes
7FAMC-BA/BB/BC	Model 610	128 Mbytes
7FAMD-BA/BB/BC	Model 610	256 Mbytes
7FBMC-BA/BB/BC	Model 620	128 Mbytes
7FBMD-BA/BB/BC	Model 620	256 Mbytes
7FCMC-BA/BB/BC	Model 630	128 Mbytes
7FCMD-BA/BB/BC	Model 630	256 Mbytes
7FDMC-BA/BB/BC	Model 640	128 Mbytes
7FDMD-BA/BB/BC	Model 640	256 Mbytes

Step 2—Memory

Select additional memory if required. All models can currently be expanded to a maximum of 512 Mbytes. There are no memory restrictions on Model 610 systems. On Model 620/630/640 systems, 64-Mbyte memory modules must be configured in pairs. There are no restrictions on the other memory modules as they all have on-board interleaving.

MS7AA-AA	64 Mbytes of memory, factory or field installed
DL-MS7AA-BA	128 Mbytes of memory, factory installed **only**
MS7AA-BA	128 Mbytes of memory, factory or field installed
DL-MS7AA-CA	256 Mbytes of memory, factory installed **only**
MS7AA-CA	256 Mbytes of memory, factory or field installed

Step 3—Console Load Device

Order an InfoServer for initial booting of console system unless one is already available on-site on the local area network.

SEACD-AA/A9	**InfoServer 150 Ethernet load device.** Includes internal RRD42 CD-ROM drive and RZ23L disk drive. Additional items are also included; see description in Chapter 7.
SEACE-AA/A9	Same as above except includes additional external RRD42 CD-ROM drive. **Note:** -AA includes 120-V power cord. -A9 requires country-specific power cord—see InfoServer 150 in Chapter 7 for listing.

Step 4—Storage Controller(s)/CI Controller

Base systems require selection of storage controller or CI controller (KFMSA included with preconfigured systems).

KFMSA-BA	**DSSI disk/tape adapter.** Total six per XMI; up to a maximum of 12 per system. Maximum number of KFMSAs is derived as follows: (25 minus the number of CIXCDs) divided by two. Requires one XMI slot; supports 14 DSSI devices. VAXcluster Software license (QL-VBRA*-AA) required for all VMS systems that will connect to a DSSI-based VAXcluster. **Note:** One CK-KFMSA-xx required with each KFMSA-BA. KFMSA and TF85 are available with a single order number—see Step 5a.
CK-KFMSA-LN	Two pairs of 1.2-m (4-ft) cables in cabinet kit. Supports mixed hosting with VAX 4000, quad-hosting of VAX 7000, and warm-swap.
KDM70-AA	**XMI disk/tape controller.** Total six per XMI; maximum 24 per system. Requires two XMI slots. Provides eight ports for DSA devices—any two available for tapes.
CK-KDM00-LF	0.9-m (3-ft) cabinet kit. Required with each KDM70-AA.
CIXCD-AC	**XMI CI controller.** Total six per XMI; maximum 10 per system. Requires one XMI slot. Each CIXCD requires one BNCIA cable set to connect system to Star Coupler. VAXcluster Software license (QL-VBRAx-AA) required for each system when multiple systems are used in a VAXcluster environment.
BNCIA-xx	**Computer interconnect cable sets.** Choose required length 10, 20 or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).
QL-VBRAx-AA	**VAXcluster license.** Required with each system that will connect to a VAXcluster (including DSSI VAXcluster system)—included with DSSI preconfigured systems; x = processor code.

Step 5—Storage

Select storage devices as required. See Chapter 7, *Storage Devices*, for complete ordering information.

Step 5a—Internal Storage (System Cabinet)

The system cabinet provides space for two disk plug-in units—each holds a maximum of three SF73 storage array building blocks. Space for one TF85 tape drive is provided.

BA654-AA	Disk plug-in unit—required for first and fourth SF73 added to system cabinet. Supports up to three SF73-LAs.
SF73-LA	4.0-Gbyte storage array building block with two RF73 disk drives. Requires BA654 disk plug-in unit, KFMSA, and CK-KFMSA cabinet kit.
TF85D-AA	TF85 2.6-Gbyte embedded cartridge tape subsystem.
TFM85-DA	TF85 starter kit—includes TF85, KFMSA, and CK-KFMSA cabinet kit.

Step 5b—External Storage (I/O Expansion Cabinet)

In addition to options described in Step 10, the I/O expansion cabinet provides space for six disk plug-in units; each holds a maximum of three SF73 storage array building blocks. See Step 5a for ordering information.

Step 5c—External Storage

The following list describes available storage devices, capacities, and components included with **initial** offerings; supported options can be added as required. See Chapter 7, *Storage Devices,* for ordering information.

Storage Arrays	Capacity	Storage Array Components
SF400	4.0–64.0 Gbytes	RF35 DSSI disk drives
SF220	5.1–61.3 Gbytes	RF35 DSSI disk drives
	18.2 Gbytes	TF857 DSSI tape drive
SF210	4.0–48.0 Gbytes	RF73 DSSI disk drives
	18.2 Gbytes	TF857 DSSI tape drive
SF200	2.0–24.0 Gbytes	RF72 DSSI disk drives
	18.2 Gbytes	TF857 DSSI tape drive
SA900	1.5–40.0 Gbytes	RA71, RA72, RA92 SDI disk drives
SA905	1.4–2.0 Gbytes	RA71, RA72 SDI removable disk drives
SA800	6.0–24.0 Gbytes	RA92 SDI disk drives
SA300	4.0–12.0 Gbytes	RA71/RA72 SDI disk drives

Storage Array Building Blocks	Capacity	Storage Array Building Block Components
SF35	1.7–10.2 Gbytes	RF35 DSSI disk drives
SF72	2.0–4.0 Gbytes	RF72 DSSI disk drives
SF73	4.0–8.0 Gbytes	RF73 DSSI disk drives
SA71	700 Mbytes–2.8 Gbytes	RA71 SDI disk drives
SA72	1.0–4.0 Gbytes	RA72 SDI disk drives

Disk Drives	Capacity
RF35 DSSI	853 Mbytes
RF72 DSSI	1.0 Gbyte
RF73 DSSI	2.0 Gbytes
RA71 SDI	700 Mbytes
RA72 SDI	1.0 Gbyte
RA92 SDI	1.5 Gbytes
ESE50 solid-state	120-600 Mbytes

Tape Drives

TF85/TF857 recommended for backup and data interchange. The system cabinet provides space for one TF85 tape drive.
Note: For additional Tx800 information see Tx800 Family of Tapes in Chapter 7, *Storage Devices.*

TF85-TA	TF85 2.6-Gbyte DSSI tabletop cartridge tape subsystem.
TF86-TA	TF86 6.0-Gbyte DSSI tabletop cartridge tape subsystem.
TF857-AA/AB	18.2-Gbyte DSSI cartridge tape subsystem for SF storage arrays and pedestals, 120 V/240 V.
TF867-AA/AB	42.0-Gbyte DSSI cartridge tape subsystem for SF storage arrays and pedestals, 120 V/240 V.
TA857-AA/AB	18.2-Gbyte CI cartridge tape subsystem for SA300/SA900 storage arrays, 120 V/240 V.
TA867-AA/AB	42.0-Gbyte CI cartridge tape subsystem for SA300/SA900 storage arrays, 120 V/240 V.
TA91/TA79/TA81	**TA91 tape drive**—maximum two masters per HSC5X-DA; two masters per KDM70. Each master supports three additional slave units. **TA79/TA81 tape drives**—maximum four per HSC5X-DA, two per KDM70; cables included. See descriptions in Chapter 7.

Step 6—CI VAXcluster Options

For CI VAXcluster configurations, select appropriate VAXcluster options. CI controller, BNCIA cables, and VAXcluster Software license required.

HSS90-GA/GB **HSS60-GA/GB**	**HSC90/60 VAXcluster starter package.** Includes HSC90-AA/AB or HSC60-AA/AB, one BNCIA-20 cable set, one HSC5X-DA disk/tape data channel, one HSC9X-FA eight-port data channel, and one SC008-AC Star Coupler.
HSC90-BA	**HSC90 storage controller.** Supports four HSC5X-DA and four HSC9X-FA data channel cards for a total of 48 ports; BNCIA-xx cable set required.
HSC60-BA	**HSC60 storage controller.** Supports one HSC5X-DA and two HSC9X-FA data channel cards for a total of 20 ports; BNCIA-xx cable set required.
BNCIA-xx	**Computer interconnect cable sets.** Choose required length of 10, 20 or 45 m (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).
HSC5X-DA	**Disk/tape channel.** Supports four DSA disk drives or tape drives. (Disks and tapes cannot be combined on the same HSC5X-DA.)
HSC9X-FA	**Disk data channel.** Supports up to eight DSA disk drives.
SC008-AC	**8-port Star Coupler.** Maximum five Star Couplers per system.
SC008-AD	**Star Coupler.** Upgrades SC008-AC to 16 ports; maximum one per SC008-AC.
CISCE-AA	**Star Coupler expander.** Upgrade to either 24 or 32 ports. Requires two SC008-ACs and two SC008-ADs for 32 ports; requires two SC008-ACs and one SC008-AD for 24 ports. Maximum 32 ports per Star Coupler.
VAXcluster Console System (VCS)	VCS provides a single, central point of control for all clusterwide console functions. Refer to Chapter 5, *VAXcluster Options/Systems Expansion*, for details.

Step 7—Networks and Communications

DEMNA 802.3/Ethernet controller included with each system. Select additional devices if required. **Note:** Connection of system to Ethernet requires an Ethernet transceiver cable, which can be connected to a DESTA, H4005, or port on a DELNI. See Chapter 6, *Networks, Communications, and Cables,* and the *Networks Buyer's Guide* for details.

LAN Communications Controllers

DEMNA-M	802.3/Ethernet controller; one included; total four per XMI; maximum 16 per system. Requires one XMI slot.
CK-DEMNA-KN	DEMNA cabinet kit, required with DEMNA-M.
DEMFA-AA	DEC FDDIcontroller 400, XMI-to-FDDI adapter; requires one XMI slot. Total four per XMI; maximum eight per system. Includes cabinet kit.

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC-type connection, e.g., BC16M cable or thick wire 15-pin AUI transceiver cable, e.g., BNE3x is required. Additional items are also required—see descriptions in Chapter 6, *Networks, Communications, and Cables,* for ordering information.

DECserver 90L+, 90TL, 700, 250, and MUXserver 300, 310, 320, 380 Terminal and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources such as backplane slots.

DEC WANrouter 250, 500; DECNIS 500, 600; Proteon 4100+; CNX500 and TransPATH 335, 350 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products

See Chapter 6, *Networks, Communications, and Cables,* and the *Networks Buyer's Guide* for details.

Step 8—Console Terminal

A console terminal with EIA-232 25-pin D-subminiature connector and printer required unless otherwise available. VT420-SA/SE, LA75S-AA/AE, and LAXXS-AD included with preconfigured systems. See Chapter 8, *Terminals and Printers,* for ordering information.

DL-VT420-xx **VT420 terminal,** 17-01364-02 console cable and H8595-A MMJ adapter required. See VT420 description for ordering details.

LA75S-xx **LA75 Plus printer.** See LA75 description for ordering details.

LAXXS-AD **VT420/LA75 table** for both VT420 and LA75.

Step 9—Terminals and Printers

Select terminals as required. See Chapter 8, *Terminals and Printers,* for ordering information.

Step 10—Expansion (System Cabinet and I/O Expansion Cabinet)

The **system cabinet** includes one 12-slot XMI-plug-in-unit and one power regulator and provides space for one TF85 tape drive, two additional power regulators, and two lower expansion bays for plug-in units. The lower bays accommodate plug-in units as follows.

System Cabinet

Expansion Bay Location	Plug-in Unit	Quantity	Expansion Bays Occupied
Lower	Disk plug-in unit	2 maximum	1 each
Lower	XMI Plug-in unit	2 maximum (included)	2 each
Lower	Battery plug-in unit	1 maximum	2

The I/O expansion cabinet includes one power regulator and provides space for one TF85 tape drive, two additional power regulators and six expansion bays—two upper and four lower—for plug-in units. The two upper bays accommodate a maximum of two disk plug-in units. The four lower bays accommodate plug-in units as follows.

I/O Expansion Cabinet

Expansion Bay Location	Plug-in Unit	Quantity	Expansion Bays Occupied
Upper	Disk plug-in unit	2 maximum	1 each
Lower	Disk plug-in unit	4 maximum	1 each
Lower	XMI Plug-in unit	2 maximum	2 each
Lower	Battery plug-in unit	1 maximum	2

H9F00-BA/BB/BC **I/O expansion cabinet,** maximum two per system.

Note: Maximum four XMI plug-in units per system; total two per cabinet (one included in system cabinet.)

DWLMA-AA **XMI plug-in unit** with 12-slot XMI I/O channel for system cabinet.

DWLMA-BB **XMI plug-in unit** with 12-slot XMI I/O channel for I/O expansion cabinet; maximum three per system.

H7237-AA **Battery plug-in unit** with batteries for battery backup/UPS capability—maximum one per cabinet. Includes four batteries to support one 48-volt power regulator and cabling for second and third H7238-AA battery option.

H7238-AA **4-pack battery option;** one required per optional 48-volt power regulator to support battery backup/UPS capability.

H7263-AA/AB **48-volt power regulator, 60 Hz/50 Hz;** maximum three per cabinet (one included). A second regulator may be required to supply adequate power depending on configuration. See power configuration table that follows. A third regulator assures redundancy and higher availability in the event of a power regulator failure. **Note:** The power configuration table provides a manual method of determining the need for a second power regulator. Equivalent power unit (EPU) is an equivalent value of power used at 48 Vdc by each option.

Power Configuration Table

EPU Values for Options in System Cabinet	EPUs	Quantity	Total EPU (Qty times EPU)
Base System includes: one power regulator, one I/O port module, one CPU module, one memory module, one XMI I/O channel, one DEMNA	30	1	30
Additional CPU modules	7		
MS7AA-AA 64 Mbytes of memory	10		
MS7AA-BA 128 Mbytes of memory	10		
MS7AA-CA 256 Mbytes of memory	10		
DWLMA-AA XMI plug-in unit	4		
DEMNA-M Ethernet XMI controller	3		
DEMFA-AA FDDI XMI adapter	6		
CIXCD-AC CI XMI controller	3		
KDM70-AA disk/tape XMI adapter	6		
KFMSA-BA DSSI XMI adapter	4		
SF73-LA storage array building block	8		
Total the last column			

If EPU is greater then 85, order second power regulator (H7263-AA/AB); EPU must not exceed 185.

EPU Values for Options in I/O Expansion Cabinet	EPUs	Quantity	Total EPU (Qty times EPU)
Expansion cabinet (H9F00-BA/BB/BC) includes; one power regulator	0	1	0
DWLMA-BB XMI plug-in unit	4		
DEMNA-M Ethernet XMI controller	3		
DEMFA-AA FDDI XMI adapter	6		
CIXCD-AC CI XMI controller	3		
KDM70-AA disk/tape XMI adapter	6		
KFMSA-BA DSSI XMI adapter	4		
SF73-LA storage array building block	8		
Total the last column			

If EPU is greater then 85, order second power regulator (H7263-AA/AB); EPU must not exceed 185.

Note: Depending on the configuration, the system offers integral UPS capability that supports all in-cabinet components for up to 11 minutes. If UPS support is required for external devices, e.g., console terminals, terminal servers, printers, modems, etc., a universal UPS can be ordered separately. See "Environmental Products" section in Chapter 5 and *The Environmental Products Catalog.*

Step 11—Software

	Model	ClusterWide License Ratings	Software Processor Code
VAX 7000	Model 610	1200	D
VAX 7000	Model 620	1800	U
VAX 7000	Model 630/640	2400	V

OpenVMS User Licenses

QL-XULA9-BB	OpenVMS/VAX interactive one-user license
QL-XULA9-BC	OpenVMS/VAX interactive two-user license
QL-XULA9-BD	OpenVMS/VAX interactive four-user license
QL-XULA9-BE	OpenVMS/VAX interactive eight-user license
QL-XULA9-BF	OpenVMS/VAX interactive 16-user license
QL-XULA9-BG	OpenVMS/VAX interactive 32-user license
QL-XULA9-BH	OpenVMS/VAX interactive 64-user license
QL-XULAA-BR	OpenVMS/VAX interactive 128-user license
QL-XULAB-BR	OpenVMS/VAX interactive 256-user license

Step 11—Software *(Continued)*

QL-XULAD-6D	Model 610 OpenVMS/VAX interactive unlimited-use license
QL-XULAU-6C	Model 620 OpenVMS/VAX interactive unlimited-use license
QL-XULAV-6H	Model 630 OpenVMS/VAX interactive unlimited-use license
QL-XULAV-6J	Model 640 OpenVMS/VAX interactive unlimited-use license
QL-VBRA*-AA	VAXcluster Software license—**Note:** * denotes processor code
QA-001AA-Hx	OpenVMS media and extended documentation, including VAXcluster and DECnet documentation
QA-09SAA-Hx	OpenVMS media and base documentation
QA-358AA-Hx	Rdb Runtime media and documentation
QA-GXXAA-Hx	POSIX media and documentation (with IEEE documentation)
QA-GXXAB-Hx	POSIX media and documentation (without IEEE documentation)

Note: x denotes media type: 5 = TK50; 8 = CD-ROM

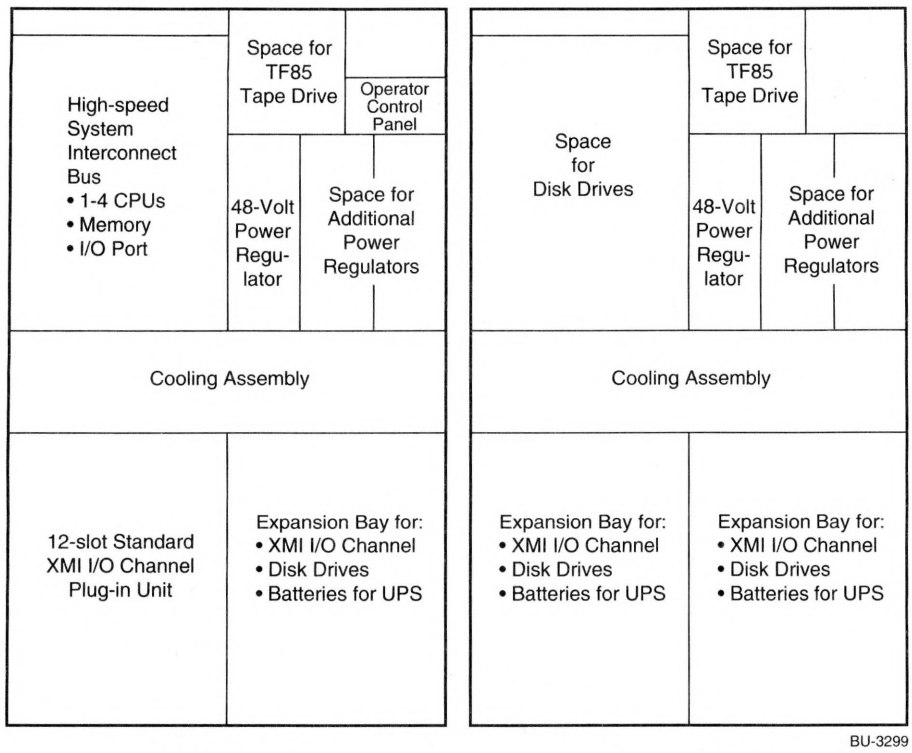
Select the appropriate NAS software level. See description of NAS packages on page 9.2. **Note:** The NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit
QL-MC2A*-AA	NAS 300 (Network Application Support 300)
QA-MC2AA-Hx	NAS 300 media and documentation kit
QL-MC5A*-AA	NAS 400 (Network Application Support 400)
QA-MC5AA-Hx	NAS 400 media and documentation kit

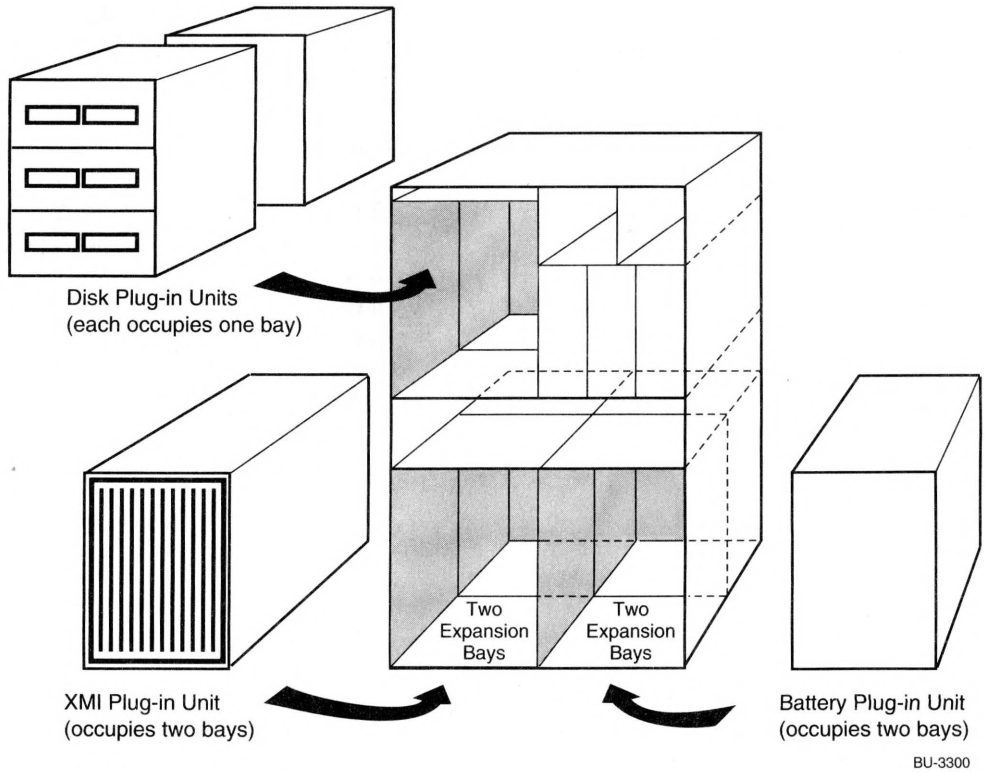
Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape
* denotes processor code.

Step 12—Environmental Power Products

Select environmental power products if required. Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* and *Digital's Environmental Power Products Catalog.*



VAX 7000 System Diagram



I/O Expansion Cabinet Sample Configuration

Note: The upper expansion bays are unavailable for disk plug-in units in the system cabinet.

VAX 7000 Systems Specifications

Physical Characteristics

	Operating	Shipping
Height	170.0 cm (67.0 in.)	195.0 cm (76.7 in.)
Width	80.0 cm (31.5 in.)	106.0 cm (41.7 in.)
Depth	86.5 cm (34.1 in.)	119.0 cm (46.8 in.)
Weight, full configuration		
Without batteries	408 kg (900 lb)	448 kg (1000 lb)
With batteries	545 kg (1,200 lb)	585 kg (1,300 lb)

Clearances	**Operating**	**Service**
Front	1.0 m	1.5 m
Rear	1.0 m	1.0 m
Sides	0	0

Environmental

	Operating	Nonoperating
Temperature	15° to 28° C (59° to 82° F)	–40° to 66° C (–40° to 151° F)
Humidity	10% to 90%	10% to 95%
Altitude	0–2.4 km (0–8000 ft)	9,100 m (30,000 ft)
Vibration	2–22 Hz @ 0.01"da minimum	22–500 Hz @ 0.25g maximum

Heat Dissipation	**Fully configured system (system cabinet)** 14,000 Btu/hr, 4120 W **Minimally configured system (system cabinet)** 4,000 Btu/hr, 1200 W	**Fully configured system (system cabinet with two I/O expansion cabinets)** 37,500 Btu/hr 11,020 W

Power Requirements[1]

	U.S./Canada	Europe/GIA	Japan
Nominal voltage	120/208 V	380–415 Y	202 V
Frequency range	50–60 Hz	50–60 Hz	50–60 Hz
Phases	3-phase star 4-wire N-GND	3-phase star 4-wire N-GND	3-phase delta 4-wire mid-GND or 3-wire junction-GND
Maximum input current/phase	24 A rms	12.8 A rms	24 A rms
Surge current	50 A peak	50 A peak	50 A peak
Rating	30 A	16 A	30 A
Power cap (system)	DEC 12-12314-00	DEC 12-30333-02	DEC 12-12314-00
Receptacle (site)	DEC 12-12315-01	Note 2	DEC 12-12315-01
Receptacle	NEMA L21-30R	IEC309	NEMA L21-30R
PCS/PDS/PDU/UPS cable	BC24W	BN29L	BC24W

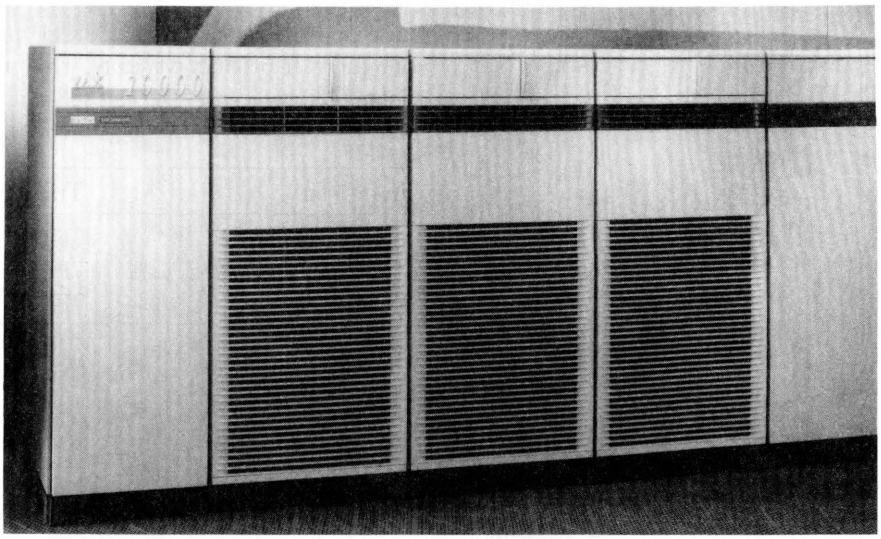
[1] Power cord is required for system cabinet and each I/O expansion cabinet.
[2] Receptacle type is Hubbell 516R6 or equivalent.

VAX 7000 CPU Upgrades

Base upgrade packages include CPU processor(s), OpenVMS base license, and one full-year product warranty. Traditional upgrade packages include OpenVMS unlimited-use license, DECnet full-function license, and one full year product warranty.

From—To	Traditional	Base
Model 610–620	7FBTA-BA	7FBTA-AA
Model 620–630	7FCTA-BA	7FCTA-AA
Model 630–640	7FDTA-BA	7FDTA-AA

VAX 10000 Systems and Servers



Product Description

Digital's VAX 10000 systems offer world class mainframe solutions for business-critical needs. These systems have been configured to deliver the best value in mainframe-class computing. They incorporate Digital's most powerful CPU technology, enhanced with additional reliability features and an extensive range of software and services. This comprehensive, integrated, packaged solution approach offers a substantial computing resource, capable of handling the high-volume online and batch production jobs that are the backbone of corporate information processing.

Every VAX 10000 model offers the reliability and high work throughput of a traditional mainframe combined with the convenience and flexibility of a personal workstation. Being Alpha-ready, VAX 10000 systems also provide an easy upgrade path to substantially greater performance in the future.

VAX 10000 systems deliver distributed computing as a core element of the mainframe strategy. Their power can be effectively switched between distributed, interactive, online transaction processing tasks and dedicated, time-critical single-stream batch jobs.

The VAX 10000 series incorporates substantial software functionality and Digital's most comprehensive service and support offerings. Together with sophisticated system management capabilities, these ensure that production system operations can be maintained with trouble-free consistency and dependability.

The VAX 10000 series is optimally suited for all commercial applications and all major industries. It is the most powerful VAX system available for finance, payroll, human resource and administrative applications. It offers superior price/performance benefits to organizations that are:

- Processing high-volume transactions or large-scale commercial batch jobs
- Exploring rightsizing and other ways to reduce mainframe costs
- Considering migrating to Alpha technology in the future
- In need of network support for distributed operations.

Product Description *(Continued)*

The VAX 10000 series has recorded highly successful benchmarks running popular financial and manufacturing third-party solutions. For example, a VAX 10000 system can complete a Fortune 10-size general ledger quarterly close in less than a single shift. Third-party applications can benefit from VAX 10000 performance.

The VAX 10000 series has been optimized to deliver the maximum throughput for mission-critical applications. It may be configured with up to four CPUs (six available in the future), each based on the newest NVAX CMOS technology. Four XMI I/O channels are available, providing throughput of up to 400 Mbytes/second to meet business needs. Memory capacity can be extended to 3.5 Gbytes—with a future release of OpenVMS, with over 10 Terabytes of disk storage available on-line.

High availability for the VAX 10000 means the ability to continue functioning in the event of power failure, not just to maintain memory contents. Ongoing operation is ensured by incorporating high reliability features into the basic design and by the provision of an N+1 redundant power system and Uninterruptible Power System (UPS) capability. The UPS sustains full processing for up to one hour in every twenty-hour period.

Large memories, local storage and optional solid state disks are all available to contribute to optimum performance. For the highest levels of capacity, all the necessary adapters are included to easily integrate the VAX 10000 series into a new or existing VAXcluster environment.

The VAX 10000 standard service and support solution is one of the most comprehensive in the industry. The highlights are:

- Formal needs assessment and operations review, which forms the basis of planning and documenting the other services via the System Implementation Plan (SIP)
- Customer Configuration Design (CCD) service, which designs and documents the optimal VAX 10000 configuration to meet application needs
- Full hardware and software installation, including environment/logistics assessment and pre-installation planning
- Consulting and training plan, which assesses startup, migration and training needs and delivers the appropriate consulting and training services
- Digital's premier hardware and software remedial support including the dedicated customer support embodied in the Mission-Critical Support Service

In addition to these services, the VAX 10000 is supplied with VAX Performance Capacity Services and Performance Management Services, and with DEC System Support (24 × 7).

The details of the support component of the VAX 10000 series may differ outside the U.S. Specific information can be obtained from a Digital representative.

The VAX 10000 is a complete mainframe-class solution. It therefore incorporates a wide range of software to facilitate rapid introduction into a customers environment and enhance their enterprise computing capability. This software includes:

- OpenVMS for unlimited use and DECnet full function.
- NAS 400, which is Digital's premier Network Application Support (NAS) offering. It includes all the functionality of NAS 200 and NAS 300. NAS 400 offers one of the most highly acclaimed transaction processing capabilities in the industry, an enhanced mission-critical environment, application and desktop integration, and access to functions such as disk shadowing, journaling and transaction processing.

Product Description *(Continued)*

Production system environments need to be able to maximize performance and concentrate on servicing end users. The VAX 10000 series supports this approach by providing the tools that optimize performance while reducing system management overhead to the minimum.

A system management workstation is included to run the VAXcluster Console System (VCS) and the DECperformance Solution (DECps) products that make up part of the VAX 10000 solution. These make major contributions to management ease, capacity planning, and tuning for high performance.

Step 1—Systems

The following items are required for traditional systems only. Appropriate functionality is provided with all other systems.

- InfoServer 100/150 for initial booting of system console
- CIXCD (CI) controller, KFMSA (DSSI) disk/tape adapter, KDM70 (SDI/STI) disk/tape controller
- System disk device
- Console terminal
- VAXcluster Software license for each system when multiple systems are used in a VAXcluster environment

Additional items may be added as required.

VAX 10000 Model 610/620/630/640 Three-Cabinet Systems include

- Three-cabinet system (1–4 CPU(s) for CI Version/1–2 CPU(s) for DSSI Version) high-speed system interconnect bus, two 12-slot XMI I/O channels
- 512 Mbytes of memory (256 Mbytes for DSSI version)
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- Two KFMSA DSSI disk/tape adapters
- CIXCD CI VAXcluster adapter (for CI version) and BNCIA-20 cable set
- DEMFA FDDI adapter
- Two Dual RF73 2.0-Gbyte disk drives with cables and disk plug-in unit
- InfoServer 150 and cable
- TF85 tape drive
- VT420 console terminal and cable*
- VT420 table
- N+1 (redundant) 48-volt power system
- Batteries to support 60 minutes of system-wide uninterruptible power capability
- OpenVMS base license (with POSIX) and unlimited-use license
- NAS 400 package (with DECnet full-function license, VAXcluster license, and Rdb Runtime license)
- DECram, Disk Striping, DEC File Optimizer licenses
- VAXstation 4000 Model 60 System Management Workstation with network connections
- VAXcluster Console System (VCS), DECps Performance Advisor license and DECps Capacity Planner license
- Network kit for InfoServer
- DECsystem support
- System Implementation Plan (SIP)
- Customer Configuration Design (CCD)
- Mission-Critical Support Service
- Hardware and software installation
- One full-year product warranty

Order Number
xK = 60 Hz, 208 V
xL = 50 Hz, 380/416 V
xM = 50/60 Hz, Japan

Model	Memory	RF73 (2.0 Gbytes)
SV-9F4BA-AK/AL/AM (CI)	Model 610	512 Mbytes	4 × RF73
SV-9F4BA-BK/BL/BM (CI)	Model 620	512 Mbytes	4 × RF73
SV-9F4BA-CK/CL/CM (CI)	Model 630	512 Mbytes	4 × RF73
SV-9F4BA-DK/DL/DM (CI)	Model 640	512 Mbytes	4 × RF73
SV-9F3BB-AK/AL/AM (DSSI)	Model 610	256 Mbytes	4 × RF73
SV-9F3BB-BK/BL/BM (DSSI)	Model 620	256 Mbytes	4 × RF73

* Not included with Japan order numbers

Step 1—Systems *(Continued)*

VAX 10000 Model 630/640 Five-Cabinet Systems include

- Five-cabinet system, 3–4 CPU(s), high-speed system interconnect bus, four 12-slot XMI I/O channels
- 512 Mbytes of memory
- Two DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- Two KFMSA DSSI disk/tape adapters
- Two CIXCD VAXcluster CI adapters and two BNCIA-20 cable sets
- DEMFA FDDI adapter
- Two dual RF73 2.0-Gbyte disk drives with cables and disk plug-in unit
- TF85 tape drive
- InfoServer 150 and cable
- VT420 console terminal, and cable*
- VT420 table
- N+1 (redundant) 48-volt power system
- Batteries to support 60 minutes of system-wide uninterruptible power (UPS) capability
- OpenVMS base license (with POSIX) and unlimited-use license
- NAS 400 package (with DECnet full-function license, VAXcluster license, and Rdb Runtime license)
- DECram, Disk Striping, DEC File Optimizer licenses
- VAXstation 4000 Model 60 System Management Workstation with network connections
- VAXcluster Console System (VCS), DECps Performance Advisor license and DECps Capacity Planner license
- Network kit for Infoserver
- DECsystem support
- System Implementation Plan (SIP)
- Customer Configuration Design (CCD)
- Mission-Critical Support Service
- Hardware and software installation
- One full-year product warranty

Order Number
xK = 60 Hz, 208 V
xL = 50 Hz, 380/416 V

xM = 50/60 Hz, Japan	Model	Memory	RF73 (2.0 Gbytes)
SV-9F4CA-CK/CL/CM	Model 630	512 Mbytes	4 × RF73
SV-9F4CA-DK/DL/DM	Model 640	512 Mbytes	4 × RF73

* Not included with Japan order numbers

VAX 10000 Traditional Systems include

- Three-cabinet system, 1–4 CPU(s), high-speed system interconnect bus, two 12-slot XMI I/O channels
- 256 Mbytes of memory
- DEC LANcontroller 400 (DEMNA) 802.3/Ethernet controller
- N+1 (redundant) 48-volt power system
- Batteries to support 60 minutes of system-wide uninterruptible power (UPS) capability
- OpenVMS base license (with POSIX) and unlimited-use license
- DECnet full-function license
- Rdb runtime license
- DECsystem support
- System Implementation Plan (SIP)
- Customer Configuration Design (CCD)
- Mission-Critical Support Service
- Hardware and software installation
- One full-year product warranty

Order Number
xK = 60 Hz, 208 V
xL = 50 Hz, 380/416 V

xM = 50/60 Hz, Japan	Model	Memory
9FAJD-AA/AB/AC	Model 610	256 Mbytes
9FBJD-AA/AB/AC	Model 620	256 Mbytes
9FCJD-AA/AB/AC	Model 630	256 Mbytes
9FDJD-AA/AB/AC	Model 640	256 Mbytes

Step 2—Memory

Select additional memory if required. All models currently support a maximum of 512 Mbytes. There are no memory restrictions as they all have on-board interleaving.

MS7AA-AA	64 Mbytes of memory, factory or field installed
DL-MS7AA-BA	128 Mbytes of memory, factory installed **only**
MS7AA-BA	128 Mbytes of memory, factory or field installed
DL-MS7AA-CA	256 Mbytes of memory, factory installed **only**
MS7AA-CA	256 Mbytes of memory, factory or field installed

Step 3—Console Load Device

InfoServer required for initial booting of system console unless one is already included with system or available on-site on the Local Area Network.

SEACD-AA/A9	**InfoServer 150 Ethernet Load Device.** Includes internal RRD42 CD-ROM drive and RZ23L disk drive. Additional items are also included; see description in Chapter 7, *Storage Devices*.
SEACE-AA/A9	Same as above except includes additional external RRD42 CD-ROM drive.

Note: -AA includes 120-V power cord.
-A9 requires country-specific power cord—see InfoServer 150 in Chapter 7, *Storage Devices*, for listing.

Step 4—Storage Controller(s)/CI Controller

Traditional systems require selection of storage controller or CI controller.

KFMSA-BA	**DSSI disk/tape adapter.** Total six per XMI; up to a maximum of 12 per system. Maximum number of KFMSAs is derived as follows: (25 minus the number of CIXCDs) divided by two. Requires one XMI slot; supports 14 DSSI devices. VAXcluster Software license (QL-VBRA*-AA) required for all VMS systems that will connect to a DSSI-based VAXcluster. **Note:** One CK-KFMSA-xx required with each KFMSA-BA. KFMSA and TF85 are available with a single order number–see Step 5a.
CK-KFMSA-LN	Two pairs of 1.2-m (4-ft) cables in cabinet kit. Allows mixed hosting of systems and warm-swap.
KDM70-AA	**XMI disk/tape controller.** Total six per XMI; maximum 24 per system. Requires two XMI slots. Provides eight ports for DSA devices—any two available for tapes.
CK-KDM00-LF	0.9-m (3-ft) cabinet kit. Required with each KDM70-AA.
CIXCD-AC	**XMI CI controller.** Total six per XMI; maximum 10 per system. Requires one XMI slot. Each CIXCD requires one BNCIA cable set to connect system to Star Coupler. VAXcluster Software license (QL-VBRAx-AA) required for each system when multiple systems are used in a VAXcluster environment.
BNCIA-xx	**Computer interconnect cable sets.** Choose required length 10, 20 or 45 meters (10 m = 32.8 ft, 20 m = 65.6 ft, 45 m = 147.6 ft).
QL-VBRAx-AA	**VAXcluster Software license.** Required with each system that will connect to a VAXcluster (including DSSI VAXcluster system)—included with NAS 400; x = processor code.

Step 5—Storage

Select storage devices as required. See Chapter 7, *Storage Devices*, for complete ordering information.

Step 5a—Internal Storage (I/O Expansion Cabinet)

The I/O Expansion Cabinet provides space for two disk plug-in units—each holds a maximum of three SF73 storage array building blocks. Space for one TF85 tape drive is also provided in both the I/O Expansion Cabinet and System Cabinet. A disk plug-in-unit and two 4-Gbyte storage array building blocks included except with traditional systems.

BA654-AA	Disk plug-in unit—required for first and fourth SF73 added to system cabinet. Supports up to three SF73-LAs.
SF73-LA	4.0-Gbyte storage array building block with two RF73 disk drives. Requires BA654 disk plug-in unit, KFMSA, and CK-KFMSA cabinet kit.
TF85D-AA	TF85 2.6-Gbyte embedded cartridge tape subsystem.
TFM85-DA	TF85 starter kit—includes TF85, KFMSA, and CK-KFMSA cabinet kit.

Step 5b—External Storage

The following list describes available storage devices, capacities, and components included with initial offerings. See Chapter 7, *Storage Devices,* for ordering information.

Storage Arrays	Capacity	Storage Array Components
SF400	4.0–64.0 Gbytes	RF35 DSSI disk drives
SF220	5.1–61.3 Gbytes	RF35 DSSI disk drives
	18.2 Gbytes	TF857 DSSI tape drive
SF210	4.0–48 Gbytes	RF73 DSSI disk drives
	18.2 Gbytes	TF857 DSSI tape drive
SF200	2.0–24 Gbytes	RF72 DSSI disk drives
	18.2 Gbytes	TF857 DSSI tape drive
SA900	1.5–40.0 Gbytes	RA71, RA72, RA92 SDI disk drives
SA905	1.4–2.0 Gbytes	RA71, RA72 SDI removable disk drives
SA800	6.0–24 Gbytes	RA92 SDI disk drives
SA300	4.0–12.0 Gbytes	RA71, RA72 SDI disk drives

Storage Array Building Blocks	Capacity	Storage Array Building Block Components
SF35	1.7–10.2 Gbytes	RF35 DSSI disk drives
SF72	2.0–4.0 Gbytes	RF72 DSSI disk drives
SF73	4.0–8.0 Gbytes	RF73 DSSI disk drives
SA71	700 Mbytes–2.8 Gbytes	RA71 SDI disk drives
SA72	1.0–4.0 Gbytes	RA72 SDI disk drives

Disk Drives	Capacity
RF35 DSSI	853 Mbytes
RF72 DSSI	1.0 Gbyte
RF73 DSSI	2.0 Gbytes
RA71 SDI	700 Mbytes
RA72 SDI	1.0 Gbyte
RA92 SDI	1.5 Gbytes
ESE50 solid-state	120–600 Mbytes

Tape Drives

TF85/TF857 recommended for backup and data interchange. See TA800 family of tape drives for numerous tape combinations available.

TF85-TA	TF85 2.6-Gbyte tabletop cartridge tape subsystem.
TF86-TA	TF86 6-Gbyte tabletop cartridge tape subsystem
TF857-AA/AB	18.2-Gbyte DSSI cartridge tape subsystem for SF storage arrays and pedestals, 120 V/240 V.
TF867-AA/AB	42.0-Gbyte DSSI cartridge tape subsystem for SF storage arrays and pedestals, 120 V/240 V.
TA857-AA/AB	18.2-Gbyte CI cartridge tape subsystem for SA300/SA900 storage arrays, 120 V/240 V.
TA867-AA/AB	42.0-Gbyte CI cartridge tape subsystem for SA300/SA900 storage arrays, 120 V/240 V.
TA91/TA79/TA81	**TA91 tape drive**—maximum two masters per HSC5X-DA; two masters per KDM70. Each master supports three additional slave units. **TA79/TA81 tape drives**—maximum four per HSC5X-DA, two per KDM70; cables included. See descriptions in Chapter 7, *Storage Devices.*

Step 6—CI VAXcluster Options

For CI VAXcluster configurations, select appropriate VAXcluster options. CI controller, BNCIA cables, and VAXcluster Software license required.

HSS90-GA/GB **HSS60-GA/GB**	**HSC90/HSC60 VAXcluster starter package.** Includes HSC90-AA/AB or HSC60-AA/AB, one BNCIA-20 cable set, one HSC5X-DA disk/tape data channel, one HSC9X-FA eight-port data channel, and one SC008-AC Star Coupler.
HSC90-BA	**HSC90 storage controller.** Supports four HSC5X-DA and four HSC9X-FA data channel cards for a total of 48 ports; BNCIA-xx cable set required.
HSC60-BA	**HSC60 storage controller.** Supports one HSC5X-DA and two HSC9X-FA data channel cards for a total of 20 ports; BNCIA-xx cable set required.
BNCIA-xx	**Computer interconnect cable sets.** Choose required length of 10, 20 or 45 meters (10m = 32.8 ft, 20m = 65.6 ft, 45m = 147.6 ft).
HSC5X-DA	**Disk/tape channel.** Supports four DSA disk drives or tape drives. (Disks and tapes cannot be combined on the same HSC5X-DA.)
HSC9X-FA	Disk data channel. Supports up to eight DSA disk drives.
SC008-AC **SC008-AD** **CISCE-AA**	**8-Port Star Coupler.** Maximum five Star Couplers per system. Star Coupler. Upgrades SC008-AC to 16 ports; maximum one per SC008-AC. **Star Coupler expander.** Upgrade to either 24 or 32 ports. Requires two SC008-ACs and two SC008-ADs for 32 ports; requires two SC008-ACs and one SC008-AD for 24 ports. Maximum 32 ports per Star Coupler.
VAXcluster Console System (VCS)	VCS connects provides a single, central point of control for all clusterwide console functions. Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* for details. Included with three-cabinet and five-cabinet systems; not included with traditional systems.

Step 7—Networks and Communications

DEMNA 802.3/Ethernet controller included with each system. Select additional devices if required. **Note:** Connection of system to Ethernet requires an Ethernet transceiver cable, which can be connected to a DESTA, H4005, or port on a DELNI. See Chapter 6, *Networks, Communications, and Cables,* and the *Networks Buyer's Guide* for details.

LAN Communications Controllers

DEMNA-M	802.3/Ethernet controller; one included; total four per XMI; maximum 16 per system. Requires one XMI slot.
CK-DEMNA-KN	DEMNA cabinet kit, required with DEMNA-M.
DEMFA-AA	DEC FDDIcontroller 400, XMI-to-FDDI adapter; requires one XMI slot. Total four per XMI; maximum eight per system. Includes cabinet kit.

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC-type connection, e.g., BC16M cable or thick wire 15-pin AUI transceiver cable, e.g., BNE3x is required. Additional items are also required—see descriptions in Chapter 6, *Networks, Communications, and Cables,* for ordering information.

DECserver 90L+/90TL/700/250 and MUXserver 300/310/320/380 Terminal and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources such as backplane slots.

DEC WANrouter 250/500; DECNIS 500/600; Proteon 4100+/CNX 500; TransPATH 335/350 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Network Connectivity Products

See Chapter 6, *Networks, Communications, and Cables,* and the *Networks Buyer's Guide* for details.

Step 8—Console Terminal

A console terminal with EIA-232 25-pin D-subminiature connector and printer is required on traditional system unless otherwise available. VT420-SA/SE and LAXXS-AD stand along with a system management workstation are included with preconfigured systems. Printer not required for configurations that include system management workstation. See Chapter 8, *Terminals and Printers,* for ordering information.

DL-VT420-xx	VT420 terminal. See VT420 description for ordering details.
LA75S-xx	LA75 Plus printer. See LA75 description for ordering details.
LAXXS-AD	VT420/LA75 table for both VT420 and LA75.

Step 9—Expansion

9FATA-XW/XY/XZ **VAX 10000 I/O expansion option, 60 Hz, 50 Hz, 50/60 Hz Japan**—upgrades a three-cabinet system to a five-cabinet system (XMI channels not included). Provides an I/O expansion cabinet with six expansion bays, two upper and four lower, N+1 redundant power system, and space for TF85 tape drive. Battery cabinet provides uninterruptible power capability. Maximum one per three-cabinet system.

Expansion Bay Location	Plug-in Unit	Quantity	Expansion Bays Occupied
Upper	Disk plug-in unit	Two maximum	One each
Lower	Disk plug-in unit	Four maximum	One each
Lower	XMI plug-in unit	Two maximum	Two each

Step 10—Software

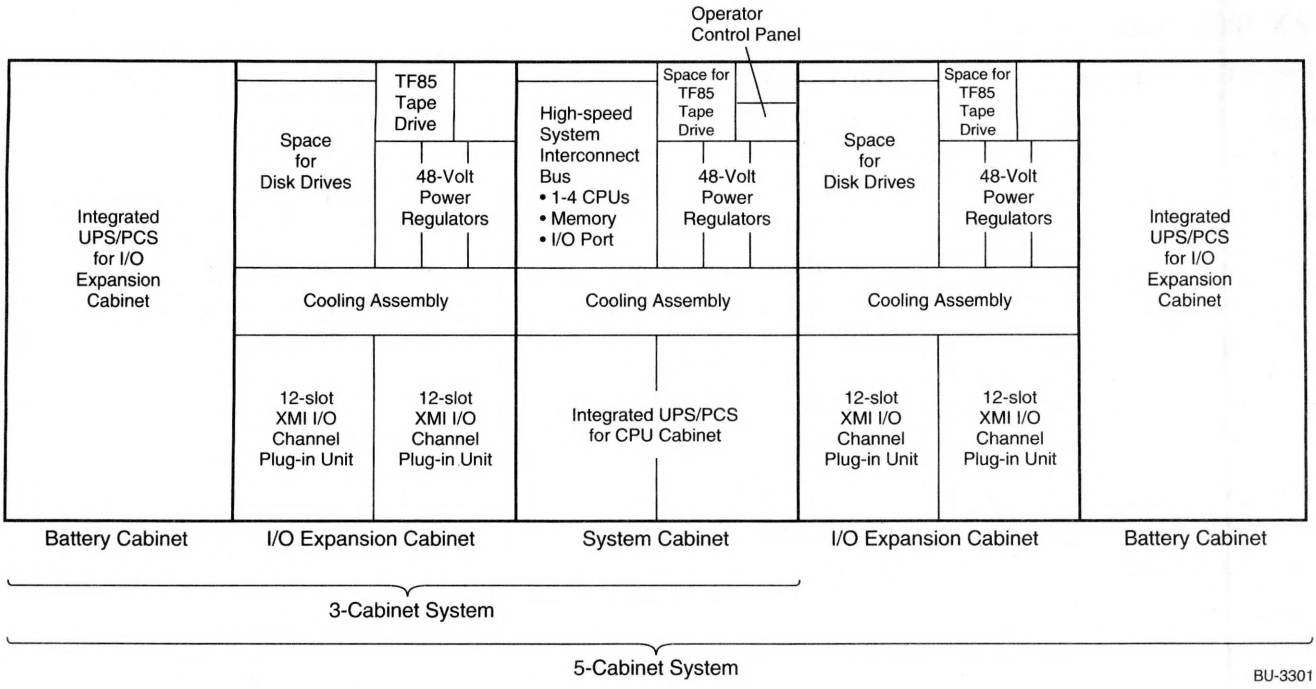
	Model	ClusterWide License Ratings	Software Processor Code
VAX 10000	Model 610	1200	D
VAX 10000	Model 620	1800	U
VAX 10000	Model 630/640	2400	V

QL-VBRA*-AA	VAXcluster Software license. **Note:** * denotes processor code
QA-001AA-Hx	OpenVMS media and extended documentation, including VAXcluster and DECnet documentation
QA-09SAA-Hx	OpenVMS media and base documentation
QA-358AA-Hx	Rdb Runtime media and documentation
QA-GXXAA-Hx	POSIX media and documentation (with IEEE documentation)
QA-GXXAB-Hx	POSIX media and documentation (w/o IEEE documentation)

Note: x denotes media type: 5 = TK50; 8 = CD-ROM. IA= interactive

Step 11—Environmental Power Products

Select environmental power products if required. Refer to Chapter 5, *VAXcluster Options/Systems Expansion,* and Digital's *Environmental Power Products Catalog.*



VAX 10000 System Diagram

VAX 10000 Specifications

Physical Characteristics	Three-Cabinet System	Five-Cabinet System
Height	170 cm (67 in.)	170 cm (67 in.)
Width	220 cm (86.7 in.)	360 cm (141.8 in.)
Depth	86.5 cm (34.1 in.)	86.5 cm (34.1 in.)
Weight	1,640 kg (3,600 lb)	2,600 kg (5,700 lb)
Environmental	**Operating Environment**	**Non Operating Environment**
Temperature	15° to 28° C (59° to 82° F)	–40° to 66° C (–40° to 151° F)
Humidity	10% to 90%	10% to 95%
Altitude	0–2.4 km (0–8,000 ft)	9100 m (30,000 ft)
Vibration	2–22 Hz @ 0.01" da minimum	22–500 Hz @ 0.25 g maximum
	Three-Cabinet System[2]	**Five-Cabinet System[3]**
Maximum ac power	6,600 Watts	10,900 Watts
Maximum heat dissipation	22,500 Btu/hour	37,200 Btu/hour

Power Requirments	U.S./Canada	Europe/GIA	Japan
Nominal voltage	120/208 Y[1]	380–415 Y[1]	202 Delta[1]
Frequency range	50–60 Hz	50–60 Hz	50–60 Hz
Phases	3-phase star 4-wire N-GND	3-phase star 4-wire N-GND	3-phase delta 4-wire mid-GND or 3-wire junction-GND
Maximum input current/phase	24 A rms	12.8 A rms	24 A rms
Surge current	50 A peak	50 A peak	50 A peak
Rating	30 A	16 A	30 A
Power cap (system)	DEC 12-12314-00	DEC 12-30333-02	DEC 12-12314-00
Receptacle (site)	DEC 12-12315-01	Note 4	DEC 12-12315-01
Receptacle	NEMA L21-30R	IEC309	NEMA L21-30R
PCS/PDS/PDU/UPS cable	BC24W	BN29L	BC24W

Notes:

1. These values are per line cord.
2. The three-cabinet system has two cabinets with line cords.
3. The five-cabinet system has three cabinets with line cords.
4. Receptacle type is Hubbell 516R6 or equivalent.

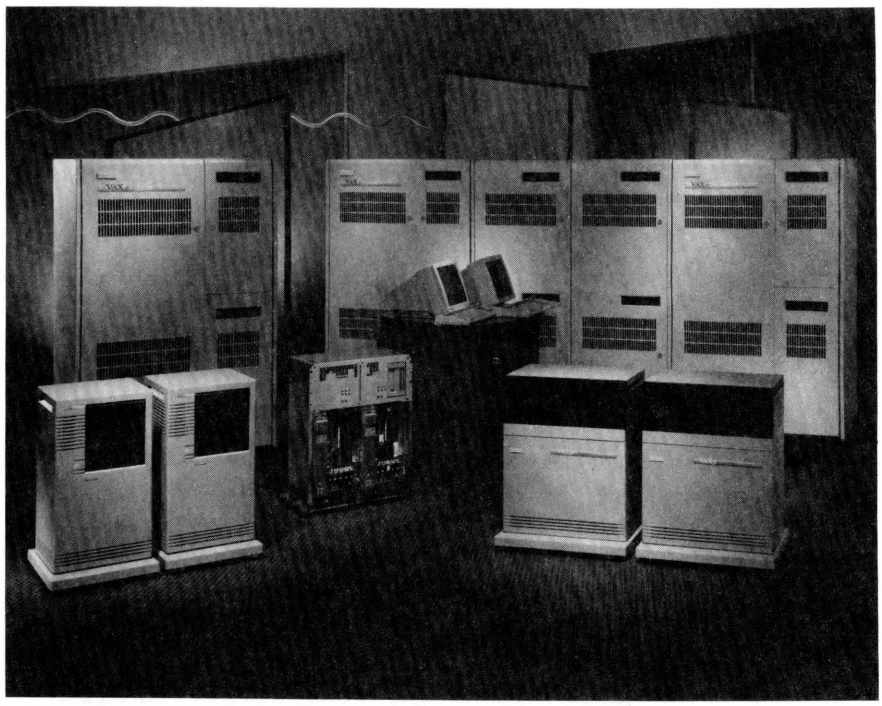
VAX 10000 CPU Upgrades

Traditional upgrade packages include a CPU module plus license upgrades for OpenVMS base license and OpenVMS unlimited-use license, DECnet full-function license and Rdb Runtime license. One full-year product warranty included.

Upgrades packages for NAS 400 based systems, which include DECnet full-function license, include a CPU module plus license upgrades for OpenVMS base and OpenVMS unlimited-use licenses. NAS 400 and layered products must be upgraded separately.

From–To	Traditional Upgrades for Base Systems	NAS 400 Upgrades for Fully Configured 3- and 5-Cabinet Systems
Model 610–620	**9FBTA-BB**	**9FBTA-IB**
Model 620–630	**9FCTA-BB**	**9FCTA-IB**
Model 630–640	**9FDTA-BB**	**9FDTA-IB**

VAXft Systems and Servers



Product Description

The VAXft series is a family of fault-tolerant computer systems that meets the performance, capacity, and availability demands of a wide range of applications running under the VMS operating system. The VAXft series is fully compatible with all other VAX and VAXcluster systems. Fault-tolerant capabilities can be introduced to enterprise-wide computer systems, without rewriting existing applications.

VAXft series systems are full implementations of a hardware-intensive fault-tolerant architecture. They provide continuous processing with the highest levels of data and computational integrity. The VAXft series consists of 11 fault-tolerant configurations that offer three levels of performance: 3.8 VUPs, 6.0 VUPs, and 12.0 VUPs.

The VAXft Model 110 is the lowest-cost fault-tolerant system. It offers performance of 3.8 VUPs and can support up to 96 Mbytes of internal memory and up to 4 Gbytes of disk storage. It is available in pedestal or rackmount configurations.

The VAXft Model 410 offers 6 VUPs of performance, up to 256 Mbytes of memory, 12 Gbytes of disk storage, and are offered in dual pedestal cabinets suitable for office installation or in rackmount versions.

The VAXft Model 610 and Model 612 are offered in 1.5-meter (60-inch) cabinets for computer room installation. The Model 610 delivers 6.0 VUPs; the Model 612 incorporates two Model 610 units into a Digital Storage Systems Interconnect (DSSI) VAXcluster system. This increases performance to 12 VUPs and provides storage and load sharing.

Each model in the VAXft series implements a hardware-intensive fault-tolerant architecture. Each VAXft system consists of two fully duplicated sets of components, called zones. Two zones ensure that there is no single point of hardware failure—a single hardware error or fault in one zone cannot disable the system. The two zones are linked by high-speed cables that provide parallel data paths. Each zone contains its own backplane to link its CPU, system I/O, and memory modules. This redundancy ensures that even the backplane is not a single point of failure.

Product Description *(Continued)*

The two CPU/memory subsystems run synchronously, executing the same instruction at the same time. As a result, the systems may be viewed as uniprocessors running one copy of the VMS operating system and other applications. The redundant cross-link pathways that interconnect the CPU modules in each zone carry the signals necessary to maintain processor synchronization. If a failure occurs in one zone, the system continues processing on the duplicate component in the other zone, without loss of data and with no performance degradation.

The VAXft series is designed to provide fault-tolerant I/O capabilities. Each system I/O module contains an Ethernet port and a DSSI port. The system I/O module design provides sufficient bandwidth and control to allow peripheral devices to work together simultaneously.

VAXft systems fit easily into existing networks and distributed systems. Ethernet and synchronous communications capabilities are built into the VAXft series for local area networks, wide area networks, and distributed systems.

For redundant Ethernet support, a single port in each of the two zones is connected to a single Ethernet rail. If one zone is down, the other zone can continue to service the network application without interruption. Multiple-rail Ethernet is supported on all VAXft systems.

Expanded synchronous communications are supported via Ethernet-based communications line servers and gateways. Asynchronous communications are also supported via Ethernet, using terminal servers. Both thick wire and ThinWire Ethernet connections are supported. Q-bus devices may be connected through DEC Commserver products.

Fault-tolerant storage is achieved by using a combination of VAX Volume Shadowing, redundant ports, redundant DSSI buses, and the data integrity features of the DSSI.

VAX Volume Shadowing software duplicates all data written to disks onto two separate volumes. This duplication ensures continuous access to data in the event of a failure on a disk or a DSSI port. Volume shadowing is totally transparent to the application.

With uninteruptible power supply (UPS) capability, which is available as an option with the Model 110, enough power is provided for the entire in-cabinet system to tolerate power fluctuations, brownouts (a series of brief outages), and full outages of up to 30 minutes per 24-hour period. It supports full application processing without any loss of work in progress.

VAXft Models 410, 610, and 612 incorporate an integral UPS. Each cabinet, including storage expansion cabinets, contains its own redundant internal UPS.

In addition to protection from power problems, each zone includes an internal environmental logic module that monitors the environmental condition of the system. This module issues warnings if acceptable thresholds are exceeded and, when possible, corrects the erroneous condition. Such correction includes improving cooling by automatically increasing fan speed or evoking the UPS.

Modules have magnetic indicators for easy identification of the failing FRU. These indicators can only be factory reset, preventing the inadvertent reinsertion of a faulty component. Replaceable DSSI disks and tapes can be removed safely without shutting down a zone of the system.

Product Description *(Continued)*

All VAXft models are designed to be repairable without interruption of applications running on the system. Each system is physically organized into two separate zones; the zone with the fault is taken completely offline to repair, even when both zones are contained within the same cabinet.

All VMS-based software products run on the VAXft series of systems. The VMS operating system and other software run on a fault-tolerant platform, taking advantage of the hardware-intensive fault-tolerant capabilities.

Model Number:	110	410	610	612
Performance				
Relative Performance (VUPs)	3.8	6.0	6.0	12.0
(TPS)	10	18	18	31
Memory				
ECC memory in 32-Mbyte segments Maximum supported (Mbytes)	96	256	256	512
I/O				
Maximum DSSI buses per system	2	2	4	2
Storage port bandwith (Mbyte/second peak)	8	8	16	16
Maximum storage capacity (Gbytes)	4	24	48	48
Maximum Ethernet Rails (redundant connection assumed)	2	4	4	4

Step 1—Systems

The following items are required:

- Two system disks (Model 110 systems are preconfigured with two disks)
- Two console terminals

VAXft systems include

- Two system zones, each include:
  - 7-slot backplane (Models 410, 610), 5-slot back-plane (Model 110)
  - CPU with integral floating-point processor
  - 32 or 64 Mbytes of ECC memory (1-Mbit DRAMs)
  - KFE52 with onboard DSSI port and Ethernet port
  - Two console ports (one local and one remote)
  - ThinWire T-connector and terminators for ThinWire, thick wire, and DSSI bus
  - Battery backup for memory, CPU, I/O, communications options, disks, and tapes
  - Cross-link cables
- One-year warranty
- Factory installed software*

* Delivery of software on a system disk is not warranted; it is provided as a convenience. Purchase of media and documentation is encouraged; see Step 7.

Note: VAXft systems include OpenVMS Volume Shadowing license and VAXft System Services license (support for VAXft System Services is included in OpenVMS operating system software).

VAXft Model 110 Systems

ADVANTAGE-SERVER System
- OpenVMS base license (with POSIX)
- NAS 300 package

DV-51AAA-BE/BJ VAXft Model 110, includes two RF31 disks; 120/240 Vac

Traditional Systems
- Pedestal enclosure
- VMS 1- to 5-user license (with Rdb Runtime)
- DECnet end-node license

SV-51AAA-AE/AJ VAXft Model 110, includes two RF31 disks; 120/240 Vac
SV-51ABA-AE/AJ VAXft Model 110, includes two RF72 disks; 120/240 Vac

OpenVMS Base Servers
- OpenVMS base license (with POSIX)

SV-51ABA-BE/BJ VAXft Model 110, includes two RF72 disks; 120/240 Vac

VAXft Model 410 Systems

Traditional Systems
- Pedestal enclosure
- VMS unlimited-user license (with Rdb Runtime)
- DECnet end-node license
- Universal (120/240-Vac) power supply

55AAA-AA Model 410 with 32 Mbytes of memory
55AAB-AA Model 410 with 64 Mbytes of memory

OpenVMS Base Servers
- OpenVMS base license (with POSIX)

55AAA-BA Model 410 with 32 Mbytes of memory
55AAB-BA Model 410 with 64 Mbytes of memory

Server Systems
- VMS File and Application Server license (with Rdb Runtime)
- DECnet full-function license
- VAXcluster license

55AAA-KA Model 410 with 32 Mbytes of memory; 120 or 240 Vac
55AAB-KA Model 410 with 64 Mbytes of memory; 120 or 240 Vac

Step 1—Systems *(Continued)*

VAXft Model 610 Systems

ADVANTAGE-SERVER Systems
- OpenVMS base license (with POSIX)
- NAS 400 package (with DECnet full-function license, VAXcluster license, and Rdb Runtime license)
- Two RF73 disk drives
- TF85 tape drive

DV-55CAB-BE/BJ Model 610 with 64 Mbytes of memory; 120/240 Vac

Traditional Systems
- 1.5-meter (60-inch) cabinet enclosure
- VMS unlimited-user license (with Rdb Runtime)
- DECnet end-node license

55CAA-AE/AJ Model 610 with 32 Mbytes of memory; 120/240 Vac
55CAB-AE/AJ Model 610 with 64 Mbytes of memory; 120/240 Vac

OpenVMS Base Server
- OpenVMS base license (with POSIX)

55CAA-BE/BJ Model 610 with 32 Mbytes of memory

Server Systems
- 1.5-meter (60-inch) cabinet enclosure
- VMS File and Application server license (with Rdb Runtime)
- DECnet full-function license
- VAXcluster license

55CAA-KE/KJ Model 610 with 32 Mbytes of memory; 120/240 Vac
55CAB-KE/KJ Model 610 with 64 Mbytes of memory; 120/240 Vac

VAXft Model 612 Systems

VAXft Model 612 systems consist of two VAXft Model 610 systems and a storage expansion enclosure. They include two each of the items included with VAXft Model 610 systems in addition to the following:

- 1.5-meter (60-inch) enclosure
- BA22E-AA 1.5-meter (60-inch) storage expansion enclosure includes:
  - DSSI cables
  - UPS for disks
- VAXcluster software license
- Factory-installed software*
- One year warranty (standard warranty recommended)

Traditional Systems
- VMS unlimited-user license (with Rdb Runtime)
- DECnet end-node license

55CDA-AE/AJ Model 612 with 32 Mbytes of memory per system; 120/240 Vac
55CDB-AE/AJ Model 612 with 64 Mbytes of memory per system; 120/240 Vac

OpenVMS Base Server
- OpenVMS base license (with POSIX)

55CDA-BE/BJ Model 612 with 32 Mbytes of memory per system; 120/240 Vac
55CDB-BE/BJ Model 612 with 64 Mbytes of memory per system; 120/240 Vac

Server Systems
- VMS File and Application server license (with Rdb Runtime)
- DECnet full-function license

55CDA-KE/KJ Model 612 with 32 Mbytes of memory; 120/240 Vac
55CDB-KE/KJ Model 612 with 64 Mbytes of memory; 120/240 Vac

Step 2—Storage

Select storage devices as required. Minimum of two system disk storage options are required. Shadow pairs must be of equal capacity. Order load device if necessary; VAXft systems running VMS Version 5.5 or higher support the InfoServer 100/150 as a software load device.

Configuration Rules

VAXft Model 110

- Maximum six RF31 or four RF72 disks (pedestal or rackmount); they cannot be mixed. TF70 tape drive can be substituted for one RF31 or RF72.
- BA22 expansion not supported on Model 110 systems
- One DSSI adapter per zone
- Maximum one TFxx per DSSI adapter

VAXft Model 410

Base System:

- Maximum four DSSI devices per system in one of the following combinations: four RFxx-JA, or three RFxx-JA and one TF70C-JA, or two RFxx-JA and two TF70C-JA
- One DSSI adapter per zone; two DSSI buses per system
- Maximum one TF70 per DSSI adapter
- One BA22D-AA expansion option supported on Model 410 systems

Base System with one BA22D-AA storage expansion option:

- Two DSSI adapters per zone; two DSSI buses per system
- Maximum 12 DSSI RFxx devices
- Maximum two TF70 devices

VAXft Model 610

Base System:

- Maximum six DSSI storage devices: four RFxx-JA disks and two TFxx tapes or TF857 loaders
- Maximum one DSSI adapter per zone; two DSSI buses per system
- Maximum one TFxx per DSSI adapter
- Maximum two BA22E-AA storage expansion enclosures

Base System with one BA22E-AA storage expansion option:

- Maximum two DSSI adapters per zone; two DSSI buses per system.
- BA22E-AA storage expansion enclosure supports a maximum of 12 DSSI storage devices

Base System with two BA22E-AA storage expansion options:

- Maximum four DSSI adapters per zone; four DSSI buses per system
- BA22E-AA storage expansion enclosures support a maximum of 12 DSSI storage devices each

VAXft Model 612

VAXft Model 612 systems consist of two Model 610 systems and include one BA22E-AA. All DSSI buses and DSSI storage devices (disks and tapes) are accessed by both systems. Disks are housed in the BA22E, tapes are housed in the system enclosures.

Base system:

- One DSSI adapter per zone; two shared DSSI buses
- Maximum 12 DSSI devices
- Maximum one additional BA22E-AA storage expansion option
- Maximum one TFxx per DSSI adapter (two per system)

Base system with one additional BA22E-AA storage expansion option:

- Two DSSI adapters per zone; four shared DSSI buses
- Maximum 24 DSSI devices

Step 2—Storage *(Continued)*

Storage Expansion Enclosures

Note: When adding BA22x-AA expansion enclosures to existing VAXft systems, system downtime must be considered.

BA22D-AA	For Model 410—requires KFE52-AA; factory or field installed.
BA22E-AA	For Models 610 and 612—requires KFE52-AA; factory or field installed.

KFE52 DSSI/Ethernet Adapter—required for addition of BA22x-AA storage expansion enclosure.

KFE52-AA	Model 410: Order two (one per zone) if adding BA22D-AA storage expansion. Model 610: Order two (one per zone) if adding one BA22E-AA; order six (three per zone) if adding two BA22E-AAs. Model 612: Order four (one per zone) if adding a second BA22E-AA storage expansion enclosure.
RF31-HA	381-Mbyte ISE for Model 110
RF31-JA	381-Mbyte RSE for Models 410/610/612 and BA22x expansion enclosures
RF31-KA	381-Mbyte ISE for BA22x expansion enclosures
RF72-HA	1-Gbyte ISE for Model 110
RF72-JA	1-Gbyte RSE for Models 410/610/612 and BA22x expansion enclosures
RF72-KA	1-Gbyte ISE for BA22x expansion enclosures
RF73-JA	2-Gbyte RSE for Models 410/610/612 and BA22x expansion enclosures
RF73-KA	2-Gbyte ISE for BA22x expansion enclosures
TF70C-RA	DSSI tape drive for Model 110
TF70C-JA	DSSI tape drive for Models 410
TF70C-AA	DSSI tape drive for Models 610/612
TF857-CA/CB	Tape loader for Model 610/612; 120/240 V
TF85C-AA	2.6-Gbyte tape drive for Models 610/612

Step 3—Memory

Select additional memory as required. Memory must be identical in each system. Two 32-Mbyte memory modules, one per zone, are included. Model 110 systems can be expanded to 96 Mbytes of mirrored memory; Models 410, 610 can be expanded to 256 Mbytes of mirrored memory. Three memory modules can be added to each system.

MS520-BB	32-Mbyte ECC mirrored memory option; consists of two 32-Mbyte modules, one for each zone.
MS520-CB	64-Mbyte ECC mirrored memory option; consists of two 64-Mbyte modules, one for each zone. Not supported on Model 110 systems.

Step 4—Networks and Communications

LAN Communications Controller

Two 802.3/Ethernet ports (on board the KFE52 modules) and two ThinWire T-connectors are included, one per zone, providing dual connection to a single Ethernet. Both ThinWire and thick wire Ethernet connections are provided. If redundant connections—up to four—to multiple Ethernets are required, select two additional Ethernet ports, one per zone per Ethernet. DECnet-VAX end-node license is provided with the base system. DECnet-VAX end-node to full-function upgrade license is required for dual Ethernet support. Refer to DECnet-VAX SPD number 25.03 for details. All asynchronous communications for the VAXft system are provided via the Ethernet. Connection of the system to the Ethernet requires Ethernet transceiver cables. Each Ethernet port can be connected to an H4005 or to ports on a DELNI. See the *Networks Buyer's Guide* for complete networking details.

KFE52-AA	802.3/Ethernet/DSSI port. Two included with base system, one per zone, for redundant connection to a single Ethernet. Order two additional KFE52-AA, one per zone, for redundant connection to dual Ethernets.

Step 4—Networks and Communications *(Continued)*

Local and Wide Area Communications Servers

Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Software media and documentation and cables are also required. See descriptions in Chapter 6, *Networks, Communications, and Cables,* for ordering information.

DECserver 90L+, 700, 250, and MUXserver 300, 310, 380 Terminal and Printer Servers

Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources.

DEC WANrouter 150, 250, 500, and TransPATH 335, 350 Multiprotocol Routers

Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

DEC Commserver 100/150

The DEC Commserver 100/150 allows Q-bus Simpact Associates, Inc. communications modules to be placed on an Ethernet—up to 80 serial lines can be connected. Lines can be configured with asynchronous or synchronous protocols at speeds up to 64 Kbytes/second. The 14 industry protocols supported on these lines have different performance specifications and the actual number of lines is a function of the type of protocol and the line speed. The DEC Commserver for VMS software provides a transparent connection between the DEC Commserver hardware and the VAX VMS host. For more information, contact the EIC Sales Support hotline at 800-832-6277 or 603-884-8990.

DSPAA-AA	DEC Commserver 100; 4- to 16-line Q-bus Simpact Associates, Inc. communications server (tabletop system chassis only)
DSPAB-BA	DEC Commserver 150; 4- to 80-line Q-bus Simpact Associates, Inc. communications server (rackmount system chassis only)
DSPAB-BB	DEC Commserver 150; 4- to 80-line Q-bus Simpact Associates, Inc. communications server (pedestal system chassis only)

Host-Based Synchronous Communication Controller

The DEC Wide Area Network Controller 620 is a two-line synchronous communication controller option specific to VAXft systems. This option can be configured to provide highly available synchronous communication. Adapters and extension cables must be ordered separately based on the interface standard requirements. For more information on the DEC WANcontroller 620, refer to Chapter 6, *Networks, Communications, and Cables,* and the *Networks Buyer's Guide.*

DEC WANcontroller 620

For redundant communications: For each two lines needed (maximum of four DSF32-AA/AB pairs per system for a total of eight fault-tolerant synchronous lines per system), order:

DSF32-AA	DEC WANcontroller 620, Y-Box, 100-pin cable and terminator—one required.
DSF32-AB	DEC WANcontroller 620, 100-pin cable, 20-pin module interconnect cable—one required.

Prerequisite software: WAN device driver kit V1.1B for VMS V5.4 or higher, plus layered communication product if needed.

For non-redundant communications: For each two lines needed (maximum eight controllers, four per zone, for a total of 16 synchronous non-redundant lines per system), order:

DSF32-AA	DEC WANcontroller 620, Y-Box, 100-pin cable and terminator—one required.

Prerequisite software: WAN device driver kit V1.1B for VMS V5.4 or higher, plus layered communication product if needed.

Network Connectivity Products

See Chapter 6, *Networks, Communications, and Cables,* and the *Networks Buyer's Guide.*

Step 5—Console Terminal

Four console ports, two per system cabinet (one local and one remote) are included.

Step 5a—Local Console

Two console terminals required, one per zone, for fault-tolerant console access. Console port supports DEC-423 cable connection except for Model 610/612, which supports EIA-232 communications. Console cable included with base system. Order two video terminals (e.g., VT420) unless otherwise available. A combination of video terminal and LA75 is recommended. For Model 610/612, order the U.S. international VT420 video terminal. See Chapter 8, *Terminals and Printers,* for ordering information.

Step 5b—Remote Console

Two remote console ports provided, one per zone. Remote console ports are used for automatic notification, upon failure, by system to notify remote customer or Digital site. These ports can also be used for dial-in from a remote site for system diagnosis. Remote console ports can be connected via modems to a remote location or to a Digital Services site. Refer to Chapter 6, *Networks, Communications, and Cables,* for modem ordering information.

Step 6—Terminals and Printers

Select terminals and printers as required. All asynchronous communications for the VAXft system are provided via the Ethernet. Terminals and printers are connected over the Ethernet to a DECserver communications server. Refer to Chapter 8, *Terminals and Printers,* and Chapter 6, *Networks, Communications, and Cables,* for ordering information.

Step 7—Software

Select operating system media and documentation for first system on site.

VAXft Model 110

Software Processor Code = S
ClusterWide License Rating = 100

VAXft Models 410/610/612

Software Processor Code	**Traditional and OpenVMS Base Servers = 2**	**Server = C**
ClusterWide License Rating	**Traditional and OpenVMS Base Servers = 300**	**Server = 10**

OpenVMS User Licenses

QL-YULA9-BB	OpenVMS/VAX interactive one-user license
QL-YULA9-BC	OpenVMS/VAX interactive two-user license
QL-YULA9-BD	OpenVMS/VAX interactive four-user license
QL-YULA9-BE	OpenVMS/VAX interactive eight-user license
QL-YULA9-BF	OpenVMS/VAX interactive 16-user license
QL-YULA9-BG	OpenVMS/VAX interactive 32-user license
QL-YULA9-BH	OpenVMS/VAX interactive 64-user license
QL-YULAA-BR	OpenVMS/VAX interactive 128-user license
QL-YULAB-BR	OpenVMS/VAX interactive 256-user license

VAXft Model 110 Traditional System License Upgrades

QL-001AS-BW	6- to 10-user license upgrade
QL-001AS-B2	11- to 20-user license upgrade
QL-001AS-BX	21- to 30-user license upgrade
QL-001AS-BY	31- to unlimited-user license upgrade

QA-001AA-H5	OpenVMS media (TK50) and extended documentation, including VAXcluster and DECnet documentation
QA-YEAAA-H5	VAXft system services media (TK50) and documentation—required
QA-358AA-H5	Rdb Runtime media (TK50) and documentation—optional
QA-GXXAA-Hx	POSIX media and documentation (with IEEE documentation)
QA-GXXAB-Hx	POSIX media and documentation (without IEEE documentation)
QA-AB2AA-GZ	Volume Shadowing documentation—optional
QT-YEAAA-E5	VAXft system services MDDS (TK50)

Select the appropriate NAS software level. See description of NAS packages on page 9.2. **Note:** The NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-MC1A*-AA	NAS 200 (Network Application Support 200)
QA-MC1AA-Hx	NAS 200 media and documentation kit
QL-MC2A*-AA	NAS 300 (Network Application Support 200)
QA-MC2AA-Hx	NAS 300 media and documentation kit
QL-MC5A*-AA	NAS 400 (Network Application Support 200)
QA-MC5AA-Hx	NAS 400 media and documentation kit

Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape; * denotes processor code

Step 7—Software *(Continued)*

VAXft Model 612

VAXft Model 612 systems are preconfigured cluster configurations consisting of two VAXft Model 610 systems. Follow guidelines for cluster installations when ordering software licenses for the VAXft Model 612.

Step 8—Environmental Power Products

VAXft Model 410/610 systems include an integral UPS that supports all in-cabinet components. This includes the CPU, memory, I/O controllers, communications controllers, disks, and tapes (tape devices are not supported on Model 610) for up to 30 minutes of battery backup per 24-hour period. If UPS support is required for external devices, such as the console terminals, terminal servers, printers and modems connected to the system, a universal UPS can be ordered separately. Select environmental power products if required. Refer to Chapter 5, *VAXcluster Options/System Expansion,* and Digital's *Environmental Power Products Catalog,* (EB-M4442-79) for details.

Uninterruptible Power System

See Chapter 5, *VAXcluster Options/System Expansion,* and Digital's *Environmental Power Products Catalog* (EB-M4442-79) for ordering information.

Step 9—Power Cords and Cables

Two power cords are required per system; 120-V power cords are included with 120-V systems. All power cords are 2.5 m (6.6 ft) long. For 240-V systems, select power cords from the following list:

VAXft Model 110

BN20A-2E	United States
BN19D-2E	Austria, Belgium, France, Germany, Finland, Netherlands, Portugal, Spain, and Sweden
BN19L-2E	Denmark
BN19Y-2E	Israel
BN19N-2E	Italy
BN19F-2E	Switzerland
BN19B-2E	United Kingdom

VAXft Models 310/410

BN12A-2E	United Kingdom
BN19C-2E	Austria, Belgium, France, West Germany, Finland, Netherlands, Portugal, Spain, and Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia and New Zealand
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN19U-2E	Israel
BN18J-1K	Japan and U.S.

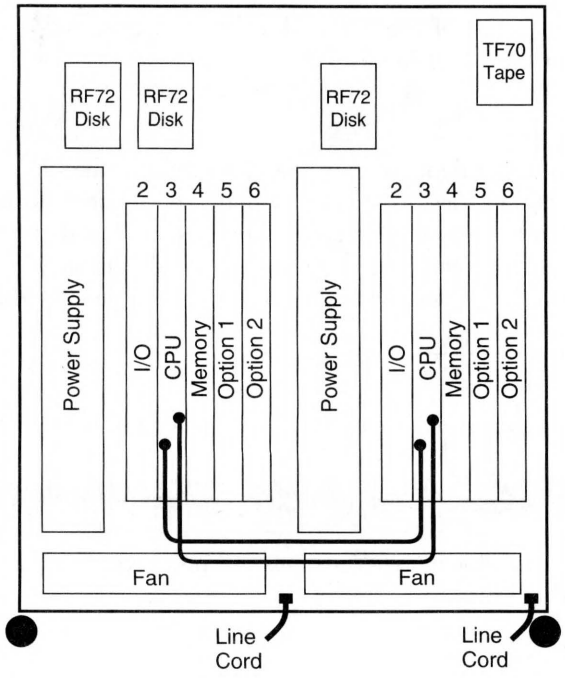
VAXft Models 610/612 Receptacles

Power cords are included with all VAXft Model 610/612 systems. These systems use a three-phase power supply. The wall receptacles are as follows: Hubbell Twist-Lock #2810A (30 A, 3-phase, 120/240 Vac, 60 Hz) and Hubbell Twist-Lock #532R6W (30 A, 3-phase, 220/380 Vac, 50 Hz).

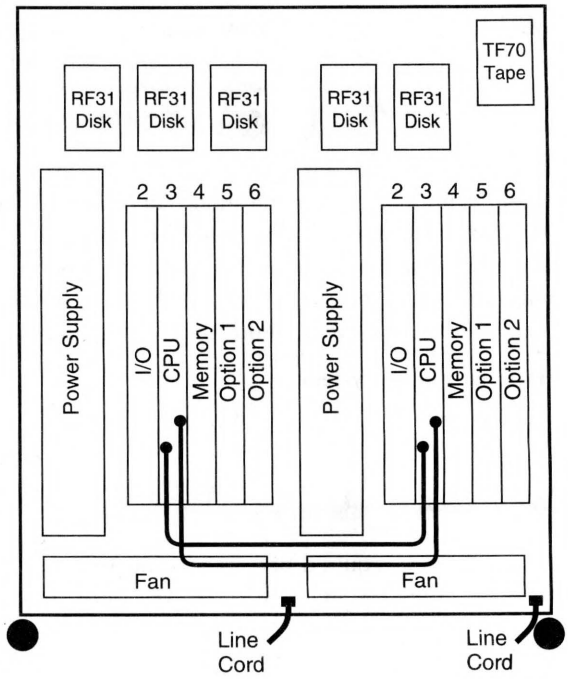
VAXft CPU Upgrade

55UPG-XX	Upgrades VAXft Model 310 to VAXft Model 410; includes two VAXft Model 410 CPUs and documentation. No software license upgrade required.

VAXft Model 110 System Diagrams

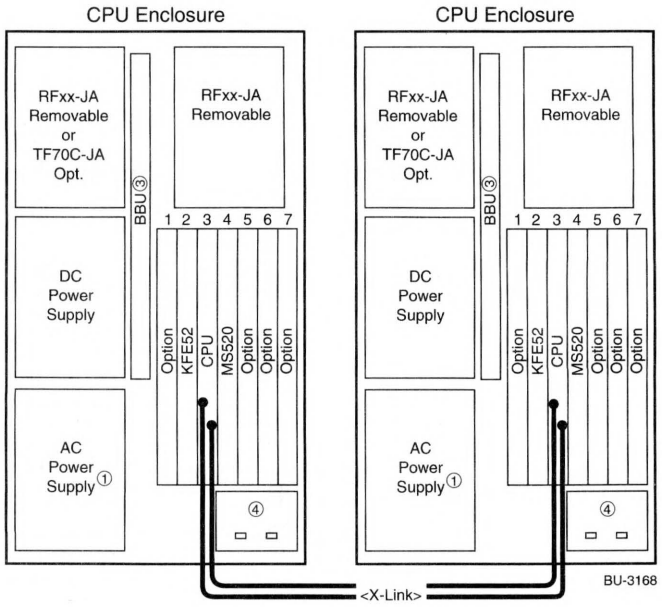


BU-3254



BU-3255

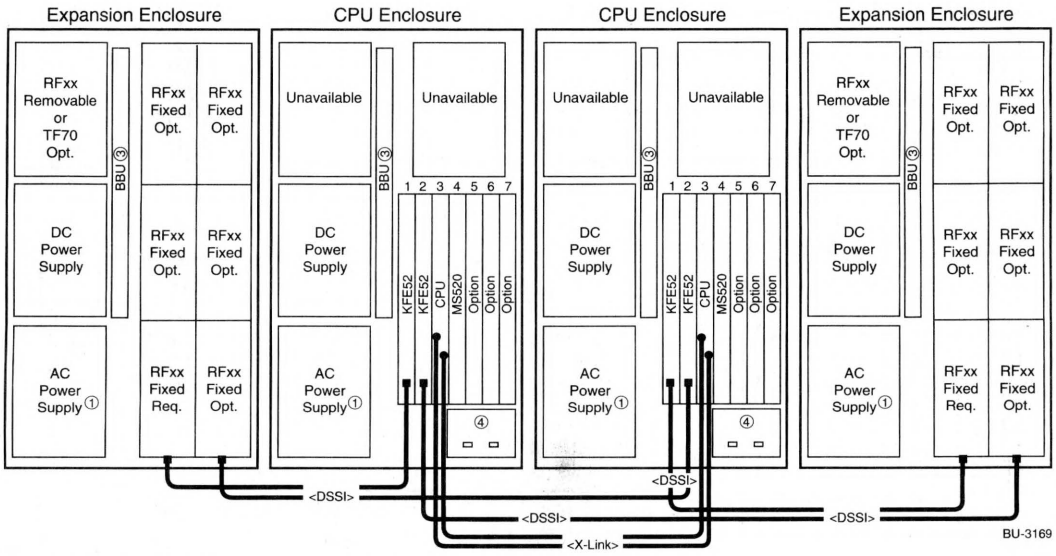
VAXft Model 410 System Diagrams



① AC power supply not used for –48/60 Vdc versions.
② Line cord required for each enclosure.
③ BBU not included with –48/60 Vdc versions.
④ Connections for local (DEC423) and remote console.

VAXft Model 410 Base System

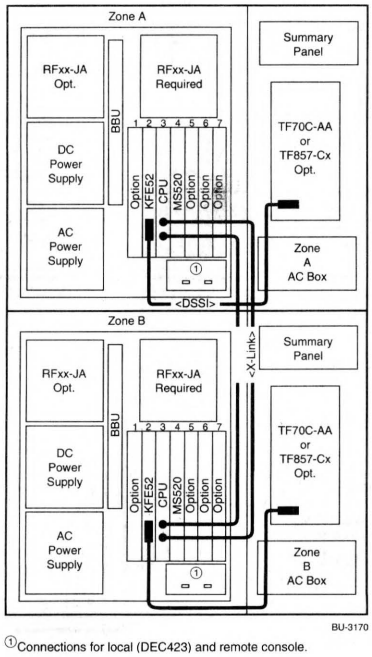
VAXft Model 410 System Diagrams



① AC power supply not used for –48/60 Vdc versions.
② Line cord required for each enclosure.
③ BBU not included with –48/60 Vdc versions.
④ Connections for local (DEC423) and remote console.

VAXft Model 410 Base System with BA22D Storage Expansion Cabinet

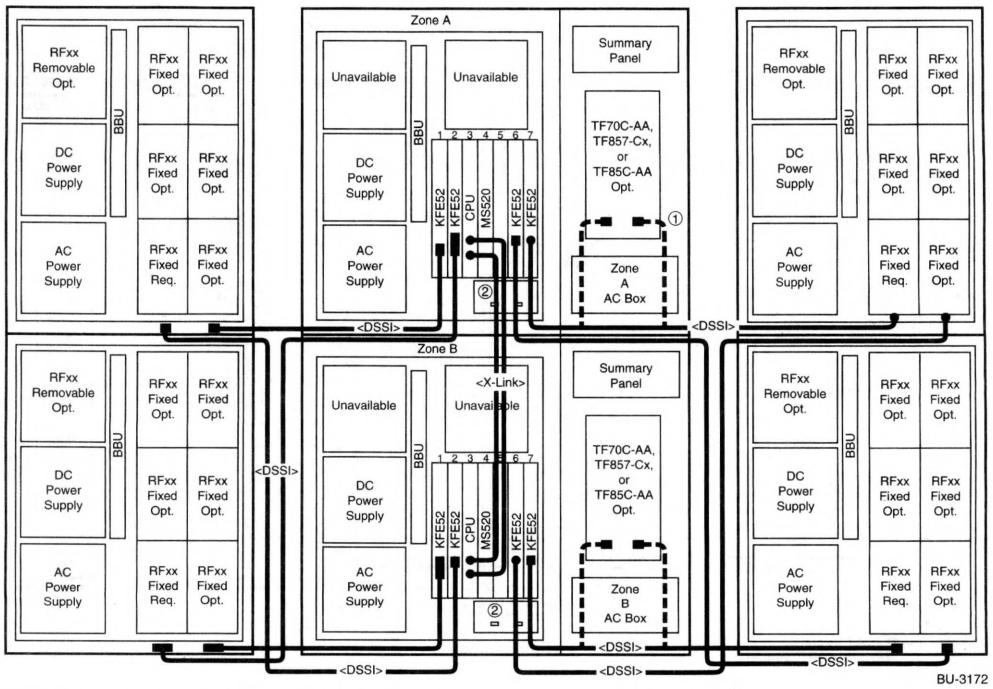
VAXft Model 610 System/Server Diagrams



①Connections for local (DEC423) and remote console.

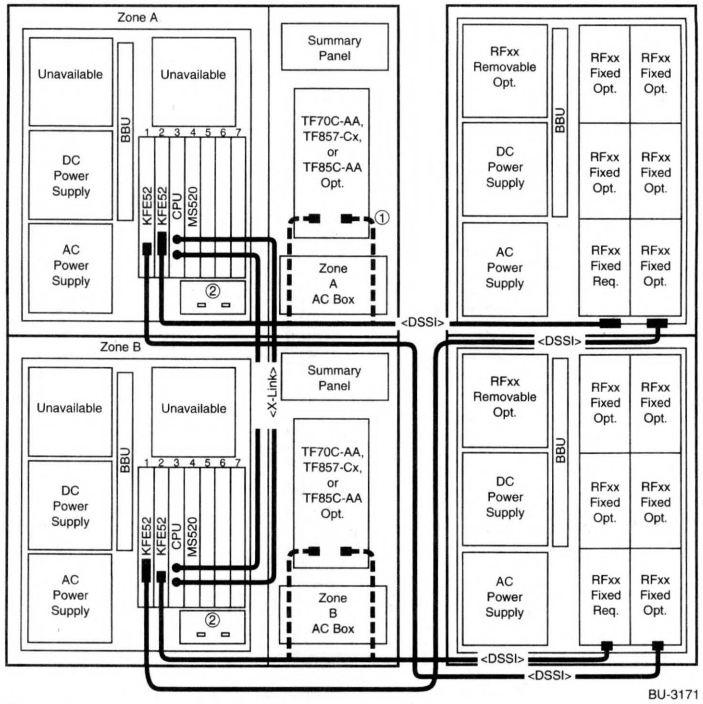
VAXft Model 610 Base System

VAXft Model 610 System/Server Diagrams



① DSSI connectors when tape devices are installed.
② Connections for local (DEC423) and remote console.

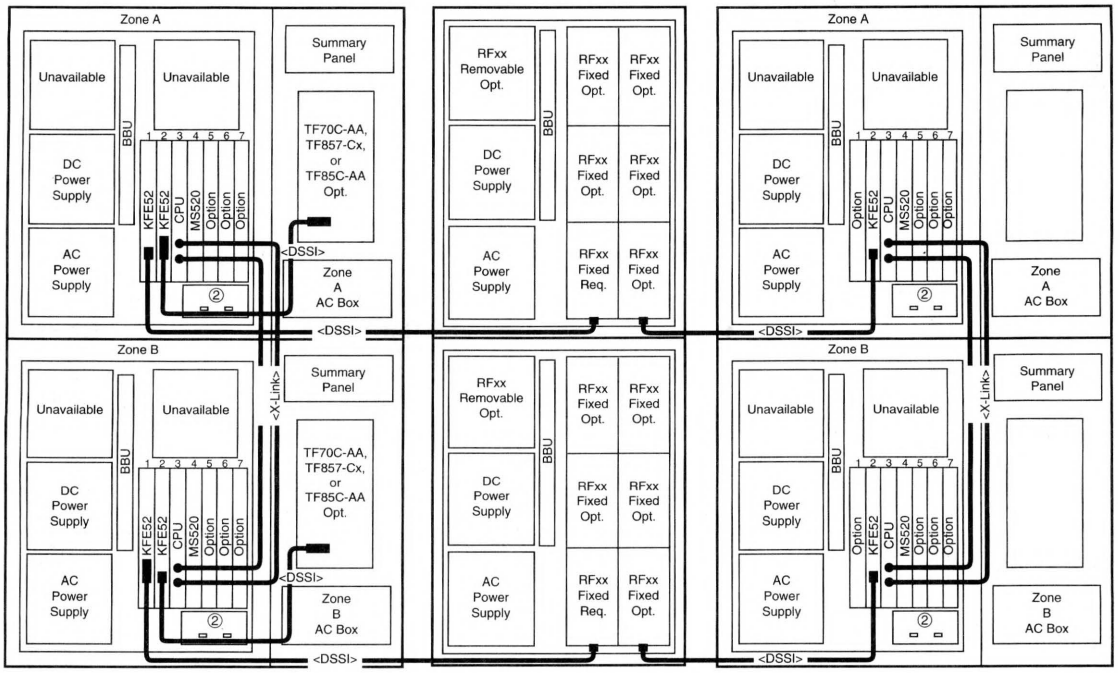
VAXft Model 610 Base System with Two BA22E Storage Expansion Cabinets



① DSSI connectors when tape devices are installed.
② Connections for local (DEC423) and remote console.

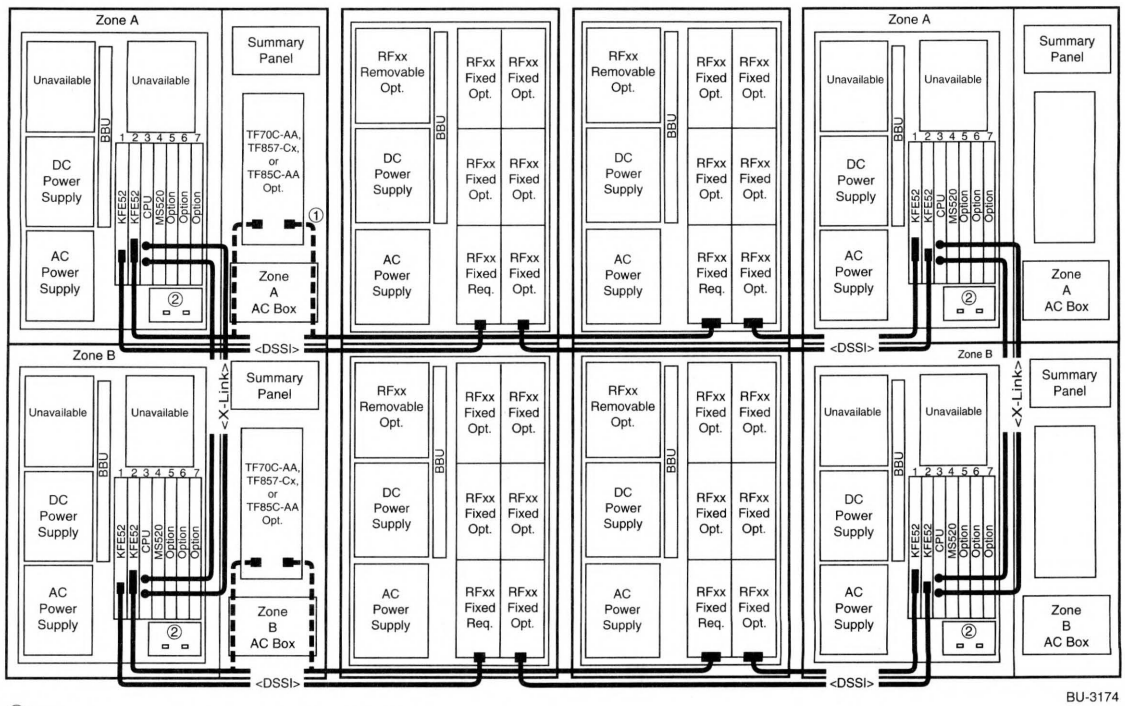
VAXft Model 610 Base System with One BA22E Storage Expansion Cabinet

VAXft Model 612 System/Server Diagrams



① DSSI connectors when tape devices are installed.
② Connections for local (DEC423) and remote console.

VAXft Model 612 Two-Node DSSI VAXcluster Base System



① DSSI connectors when tape devices are installed.
② Connections for local (DEC423) and remote console.

VAXft Model 612 Two-Node DSSI VAXcluster Base System with BA22E Storage Expansion

Specifications

Physical Characteristics	Model	110	410	610	612
Base System	Height	69.0 cm (27.0 in.)	67.3 cm (26.5 in.)	1.5 m (60.0 in.)	1.5 m (60.0 in.)
	Width	53.0 cm (21.0 in.)	109.2 cm (43.0 in.)	91.4 cm (36.0 in.)	2.4 m (96.0 in.)
	Depth	45.7 cm (18.0 in.)	45.7 cm (18.0 in.)	76.2 cm (30.0 in.)	76.2 cm (30.0 in.)
	Weight	68.0 kg (151 lb)	218.2 kg (480 lb)	390 kg (858 lb)	1107 kg (2436 lb)

		BA22D (for Model 410)	BA22E (for Models 610/612)
Storage Expansion (Not supported on Model 110 systems)	Height	67.3 cm (26.5 in.)	1.5 m (60.0 in.)
	Width	109.2 cm (43.0 in.)	60.9 cm (24.0 in.)
	Depth	45.7 cm (18.0 in.)	76.2 cm (30.0 in.)
	Weight	218.2 kg (480 lb)	327.3 kg (720 lb)

Power	Model	110	410	610	612
Input voltage support (Vac)		120 240	120 240	120 240	120 240
Base power consumption (Watts)					
Base System		650	1400	2000	5400
Storage expansion		N/A	1000*	1000	1000
Thermal dissipation (Btu's)					
Base system		2219	4778	6826	17065
Storage expansion		N/A	3413	3413	3413
Operating temperature		10° to 40° C with storage			
Relative humidity		10% to 90%			

* Total power consumption for two storage expansion enclosures.

BA22D Storage Expansion Option for VAXft Model 310/410

Total of one BA22D Storage Expansion option may be added to the base system. Adding this option is a major upgrade. **System downtime must be considered.**

This option consists of two storage expansion enclosures (rackmount or pedestal) with integral UPS. Each enclosure can house up to six DSSI devices. Total Four KFE52-AA are required to connect the BA22D. With the addition of this option, storage devices already installed in the base system enclosures must be removed and may be used in the storage expansion enclosures. Maximum of two removable storage devices (tape or disk) can be re-used and installed (one within each of the BA22D two storage expansion cabinets).

BA22D-AA	120/240 Vac, pedestal enclosure
BA22D-BA	120/240 Vac, rackmount enclosure

BA22E Storage Expansion Option VAXft Model 610/612

Total of two BA22E Storage Expansion options may be installed for the VAXft Models 610 and 612. Adding this option is a major upgrade. **System downtime must be considered.**

This option consists of two storage cages housed in a single 1.5-meter (60-inch) cabinet. Each cage has it own power and UPS system and can house up to six DSSI disk storage options for a total of 12 disk devices in a single 1.5-meter (60-inch) cabinet using two DSSI buses. Total of four KFE52-AA are required to connect each BA22E storage option. With the addition of the BA22E, storage devices already installed in the base system enclosures excluding tape devices must be removed and may be used in the BA22E storage expansion. Maximum of two removable storage devices (disk only) can be re-used and installed.

BA22E-AA	120/240 Vac 1.5-meter (60-inch) enclosure

Storage Devices for Expansion Cabinets

RF31-JA	Maximum four in base system enclosure; maximum two per BA22D/BA22E enclosure
RF31-KA	Maximum 12 per BA22D/BA22E-AA enclosure
RF31-HA	Maximum six per VAXft Model 110
RF72-JA	Maximum four in base system enclosure; maximum two per BA22D/BA22E enclosure
RF72-KA	Maximum 12 per BA22D/BA22E-AA enclosure
RF72-HA	Maximum four per VAXft Model 110
RF73-JA	Maximum four in base system enclosure; maximum two per BA22D/BA22E enclosure
RF73-KA	Maximum 12 per BA22D/BA22E-AA enclosure
TF70C-JA	Maximum two tape drives per VAXft Model 410 system.
TF70C-AA	Maximum two tape drives per VAXft Model 610/612 system.
TF70C-RA	VAXft Model 110
TF857-CA/CB	Maximum two tape loaders per VAXft Model 610/612 system, 120/240 Vac.
TF85C-AA	2.6-Gbyte cartridge tape drive. Maximum two tape drives per VAXft Model 610/612 system.
KFE52-AA	KFE52 DSSI/Ethernet adapter. Total four KFE52 are required per system to connect each BA22E/BA22D storage expansion option. Two KFE52 are included with the base system.

VAXft Model 110/410 Rackmount Systems/Servers

Product Description

VAXft Models 110 and 410 are offered as 48.3-cm (19-inch) wide, RETMA, rackmountable systems (cabinet not included). These systems mount in a standard 48.3 cm (19-inch) cabinet with a vertical mounting space of 66 cm (26 inches) (including rackmount base).

Rackmount VAXft systems offer the same functionality as the standard VAXft systems and support the same I/O options and hardware. With rackmount systems the office base with casters is replaced with a rackmount base. The rackmount base ensures support for the transformer and allows spacing for proper airflow.

To ensure FCC compliance, the rackmountable VAXft systems must be mounted in a standard EMI shielded cabinet (not provided by Digital). OEMs who have special packaging needs can mount the chassis in their own enclosures and are responsible for FCC compliance through self-certification.

BA22 enclosures can weigh up to 109 kg (240 pounds) for the processor enclosure and up to 122.7 kg (270 pounds) for the storage expansion enclosure. The cabinet's 19-inch RETMA rail system must be designed to handle a hang weight of 245 kg (540 pounds)—one BA22 processor and one BA22 expansion enclosure mounted on a one rail system. Another consideration is power distribution—when adding power control to a rackmount cabinet, a single point of failure should be avoided when using a single power controller for multiple BA22 CPU cabinets.

Ordering Information

Traditional Systems—Model 110 Rackmount Traditional Systems include VMS 1- to 5-user license (with Rdb Runtime) and DECnet end-node license.

SV-51BAA-AE/AJ	Includes two RF31 disks; 120/240 Vac
SV-51BBA-AE/AJ	Includes two RF72 disks; 120/240 Vac

OpenVMS Base Servers include OpenVMS base license

SV-51BAA-BE/BJ	Includes two RF31 disks; 120/240 Vac
SV-51BBA-BE/BJ	Includes two RF72 disks; 120/240 Vac

Traditional Systems—Model 410 Rackmount Traditional Systems include VMS unlimited-user license (with Rdb Runtime), and DECnet end-node license.

55BAA-AA	Model 410 with 32 Mbytes of memory; 120 or 240 Vac (universal power supply)
55BAB-AA	Model 410 with 64 Mbytes of memory; 120 or 240 Vac (universal power supply)

OpenVMS Base Servers include OpenVMS base license

55BAA-BA	Model 410 with 32 Mbytes of memory, 120/240 Vac
55BAB-BA	Model 410 with 64 Mbytes of memory, 120/240 Vac

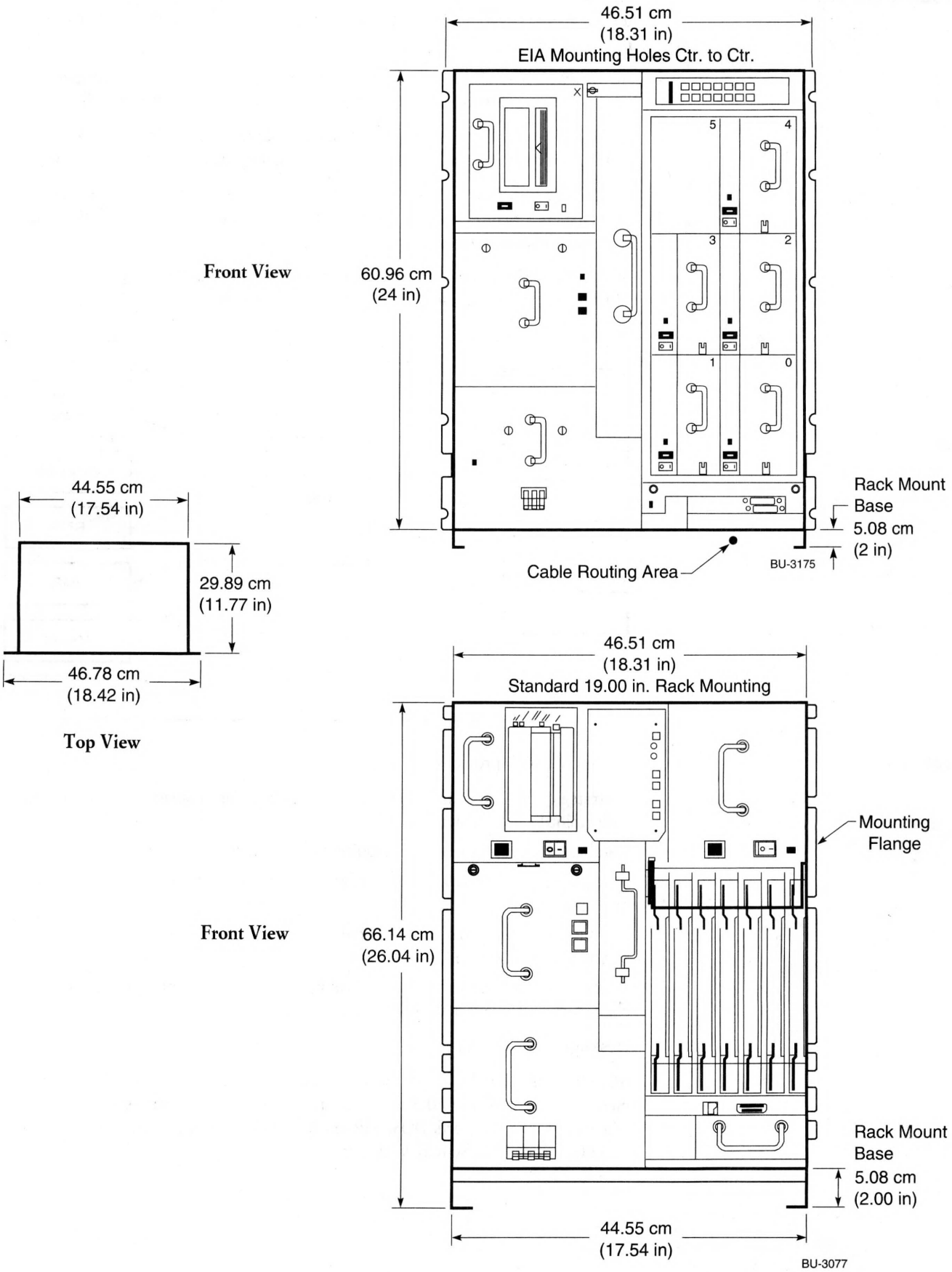
Server Systems

Model 410 Rackmount Server systems include VMS File and Application Server license, VAXcluster license, and DECnet full-function license:

55BAA-KA	Model 410 with 32 Mbytes of memory; 120 or 240 Vac (universal power supply)
55BAB-KA	Model 410 with 64 Mbytes of memory; 120 or 240 Vac (universal power supply)

With the exception of the system information listed above, Rackmount VAXft configuring information is identical to the configuring information in the VAXft systems' menu. Refer to the VAXft ordering menus for complete ordering information.

VAXft Model 410 Rackmount Diagram



ACCESSWORKS Data Integration Servers

Product Overview

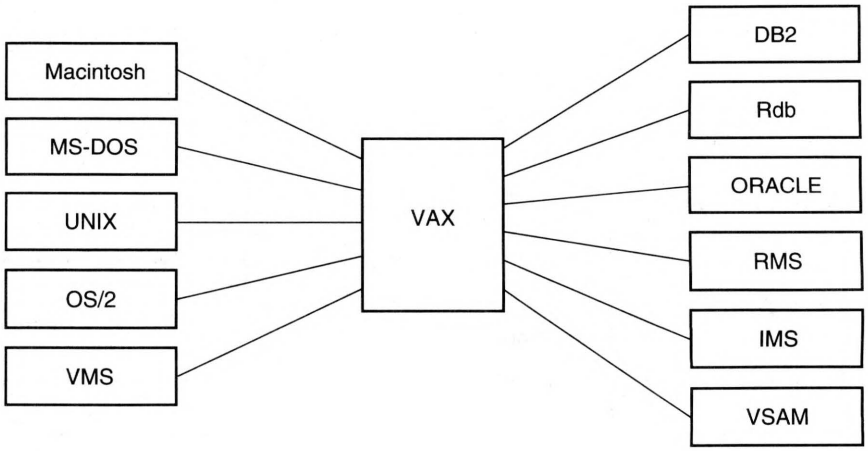
Desktop computing has delivered vast power and flexibility to the user. Providing these users with manageable access to enterprise data is the challenge faced by MIS organizations today.

ACCESSWORKS provides everything necessary to access database information as it consolidates, distributes, and manages data securely and automatically.

ACCESSWORKS provides an alternative to expensive mainframe upgrades. Datacenter capacity can be extended by offloading database query activities.

ACCESSWORKS systems provide the strategic direction sought by corporate data management organizations. ACCESSWORKS is the solution to their data distribution and desktop data access needs.

ACCESSWORKS framework consists of three components: desktop PCs, the ACCESSWORKS server, and one or more data repositories.



Features

ACCESSWORKS provides:

- A strategic, flexible solution providing simplified data management compared with point-to-point solutions
- Database access that does not require specialized interconnect design
- A single vendor for support of hardware, software, and corporate data management strategy
- The unloading and freeing of the database mainframe with its associated performance extension
- A family of client/server integrated solutions that are preconfigured, tested, and characterized for optimal performance

Desktop Environment

ACCESSWORKS utilizes NAS tools, including the SQL application programming interface, and PATHWORKS, to integrate the desktop computing environment. ACCESSWORKS supports DOS, Microsoft Windows, OS/2, Macintosh, VAX, ULTRIX, and UNIX System V clients.

Features *(Continued)*

Target Databases

ACCESSWORKS provides read access to a variety of corporate databases, including IBM DB2, VSAM, and VAX Oracle, as well as read/write access to Rdb and RMS.

IBM databases are accessed via high-performance DECnet/SNA-ST and -CT Gateways or through cost-effective DECnet/SNA software.

Data Storage and Ad-hoc Query Capability

ACCESSWORKS can act as a decentralized data storage point, or can be the platform for interactive "ad-hoc" queries.

ACCESSWORKS uses VAX Data Distributor, VAX Common Data Dictionary, and Digital's interoperability products (VIDA and RdbAccess) so data can be extracted or rolled up from a number of sources, relational and non-relational, into a single relational database.

ACCESSWORKS provides seamless routing and translation of interactive queries. The desktop user can issue ad-hoc queries to remote databases. Data is returned quickly and easily for local analysis and presentation.

Interactive query and data storage can be used in conjunction to provide the fullest flexibility of data access.

Platforms

ACCESSWORKS is a scalable solution based on specific VAX platforms.

Step 1—System

Select the ACCESSWORKS base system.

ACCESSWORKS base systems include

- VAXstation, MicroVAX, or VAX server system
- OpenVMS
- NAS 200, NAS 250, NAS 300, or NAS 400 (high availability)
- DECnet/OSI end-node license (with PATHWORKS for VMS)
- System disk and memory
- VAX Rdb/VMS
- Compact disc load device (except ACCESSWORKS 6610 and 7610; see note 2 below)
- ACCESSWORKS media/documentation—includes NAS and layered product images for ACCESSWORKS base systems and all ACCESSWORKS options.
- Layered software licenses:
  - VAX Common Data Dictionary
  - DEC RdbAccess for VAX RMS

Order Number	System	NAS	Memory	Disk
ACCESSWORKS—OpenVMS User-Based Licenses				
DJ-DB2AA-AB	ACCESSWORKS 4000-VLC, 50 Hz	250	8 MB	426 MB
DJ-DB2AA-AC	ACCESSWORKS 4000-VLC, 60 Hz	250	8 MB	426 MB
DJ-DB3EA-AA	ACCESSWORKS 3130	200	16 MB	426 MB
DJ-DB3DA-AA	ACCESSWORKS 3180	200	16 MB	426 MB
DJ-DB4DA-AA	ACCESSWORKS 4100	300	32 MB	852 MB
DJ-DB4EA-AA	ACCESSWORKS 4500	300	64 MB	852 MB
DJ-DB4FA-AA	ACCESSWORKS 4600	300	64 MB	852 MB
DJ-DB6CA-AB	ACCESSWORKS 6610, 50 Hz	300	64 MB	2 GB
DJ-DB6CA-AC	ACCESSWORKS 6610, 60 Hz	300	64 MB	2 GB
DJ-DB7AA-AB	ACCESSWORKS 7610, 50 Hz	300	64 MB	2 GB
DJ-DB7AA-AC	ACCESSWORKS 7610, 60 Hz	300	64 MB	2 GB
ACCESSWORKS—File and Application Server License				
DJ-DB3CA-AA	ACCESSWORKS 3130	200	16 MB	426 MB
DJ-DB3BA-AA	ACCESSWORKS 3180	200	16 MB	426 MB
DJ-DB4AA-AA	ACCESSWORKS 4300	300	16 MB	426 MB
DJ-DB4BA-AA	ACCESSWORKS 4500	300	64 MB	852 MB
DJ-DB4CA-AA	ACCESSWORKS 4500	400	64 MB	852 MB
DJ-DB6AA-AB	ACCESSWORKS 6610, 50 Hz	300	64 MB	2 GB
DJ-DB6AA-AC	ACCESSWORKS 6610, 60 Hz	300	64 MB	2 GB
DJ-DB6BA-AB	ACCESSWORKS 6610, 50 Hz	400	64 MB	2 GB
DJ-DB6BA-AC	ACCESSWORKS 6610, 60 Hz	400	64 MB	2 GB

Notes:

1. Each system requires the addition of a console. This can be a country-specific VT100/VT200-compatible terminal.
2. ACCESSWORKS 6610 and 7610 require the addition of an InfoServer 150 and associated country kit (order numbers **SEACD-AA** and **SEAKC-xx**) as load device unless one is already resident on the local network.
3. Distribution media for ACCESSWORKS software and VMS is CD-ROM.

Step 2—Memory Sizing

Select additional memory depending on number of clients. Refer to the following table for recommended memory configurations.

ACCESSWORKS System	Number of Clients	Total Memory Required
ACCESSWORKS 4000-VLC	25	8 MB
ACCESSWORKS 3130	70	32 MB
ACCESSWORKS 3180	120	64 MB
ACCESSWORKS 4100	170	
ACCESSWORKS 4300	100	128 MB
ACCESSWORKS 4500	175	256 MB
ACCESSWORKS 4600	250	128 MB
ACCESSWORKS 6610	256	256 MB
ACCESSWORKS 7610	300	

Step 3—IBM Connectivity

Select from one of three SNA connectivity options: ACCESSWORKS/SNA, ACCESSWORKS/SNA-ST, and ACCESSWORKS/SNA-CT. Target IBM databases include DB2, VSAM, IMS.

ACCESSWORKS/SNA includes

- VMS/SNA software
- VIDA client software license
- LU 6.2 software license
- VAX DTF server software license
- Wide are device driver software
- DF296 9600-b/s modem
- Serial line controller

QP-LBXAA-01	ACCESSWORKS/SNA for ACCESSWORKS 4000-VLC
DJ-DB3CB-AA	ACCESSWORKS/SNA for ACCESSWORKS 3130
DJ-DB3BB-AA	ACCESSWORKS/SNA for ACCESSWORKS 3180
DJ-DB4DB-AA	ACCESSWORKS/SNA for ACCESSWORKS 4100
DJ-DB4AB-AA	ACCESSWORKS/SNA for ACCESSWORKS 4300
DJ-DB4BB-AA	ACCESSWORKS/SNA for ACCESSWORKS 4500/ACCESSWORKS 4600
DJ-DB6AB-AA	ACCESSWORKS/SNA for ACCESSWORKS 6610
DJ-DB7AB-AA	ACCESSWORKS/SNA for ACCESSWORKS 7610

ACCESSWORKS/SNA-ST includes

- DECnet/SNA Gateway-ST
- VIDA client software license
- LU 6.2 software license
- VAX DTF server software license

DJ-DB2AC-AA	ACCESSWORKS/SNA-ST for ACCESSWORKS 4000-VLC
DJ-DB3CC-AA	ACCESSWORKS/SNA-ST for ACCESSWORKS 3130/80
DJ-DB4DC-AA	ACCESSWORKS/SNA-ST for ACCESSWORKS 4100
DJ-DB4AC-AA	ACCESSWORKS/SNA-ST for ACCESSWORKS 4300
DJ-DB4BC-AA	ACCESSWORKS/SNA-ST for ACCESSWORKS 4500/4600
DJ-DB6AC-AA	ACCESSWORKS/SNA-ST for ACCESSWORKS 6610
DJ-DB7AC-AA	ACCESSWORKS/SNA-ST for ACCESSWORKS 7610

Step 3—IBM Connectivity *(Continued)*

ACCESSWORKS/SNA-CT includes

- DECnet/SNA Gateway-CT
- VIDA client software license
- LU 6.2 software license
- VAX DTF server software license

DJ-DB2AD-AA	ACCESSWORKS/SNA-CT for ACCESSWORKS 4000-VLC
DJ-DB3CD-AA	ACCESSWORKS/SNA-CT for ACCESSWORKS 3130/80
DJ-DB4DD-AA	ACCESSWORKS/SNA-CT for ACCESSWORKS 4100
DJ-DB4AD-AA	ACCESSWORKS/SNA-CT for ACCESSWORKS 4300
DJ-DB4BD-AA	ACCESSWORKS/SNA-CT for ACCESSWORKS 4500/4600
DJ-DB6AD-AA	ACCESSWORKS/SNA-CT for ACCESSWORKS 6610
DJ-DB7AD-AA	ACCESSWORKS/SNA-CT for ACCESSWORKS 7610

Notes:

1. Access to IBM databases by the ACCESSWORKS/SNA option requires the addition of an internal VAXBI (order number **DWMBB-DA**) to ACCESSWORKS 6610 systems.
2. Access to IBM DB2 databases requires VIDA server software on the IBM host. This software (**QL-VTXAX-xx** and **QA-VTXAA-xx**) needs to be ordered unless already resident on the IBM host.
3. Access to IBM DB2 databases requires DTF software on the IBM host unless already resident.

DTF for MVS

QL-1GQA9-AA	Software license
QA-1GQAA-xx	Software media
QA-1GQAA-GZ	Software documentation
QA-1GQA*-xx	Software product services

DTF for VM

QL-GUYA9-AA	Software license
QA-GUYAA-xx	Software media
QA-GUYAA-GZ	Software documentation
QA-GUYA*-xx	Software product services

4. Batch access to IBM IMS databases requires Data Extract, an IBM product, to be resident on the IBM host. The order number is 5668-788, Data Extract, Version 2, Release 4 for MVS and VM. This software needs to be ordered unless already resident on the IBM host.

*Denotes processor code, xx denotes media type. For additional information on available licenses, services, and media, refer to the appropriate price book.

Step 4—ACCESSWORKS/SNA-BASIC

ACCESSWORKS/SNA-BASIC allows the utilization of existing -ST or -CT gateways in connecting to IBM systems. It provides provides SNA connectivity for incremental ACCESSWORKS base systems.

ACCESSWORKS/SNA-BASIC includes

- VIDA client software license
- LU 6.2 software license
- VAX DTF server software license

QP-LBYAA-05	ACCESSWORKS/SNA-BASIC for ACCESSWORKS 4000-VLC
QP-LBYAA-01	ACCESSWORKS/SNA-BASIC for ACCESSWORKS 3130/80
QP-LBYAA-06	ACCESSWORKS/SNA-BASIC for ACCESSWORKS 4100
QP-LBYAA-02	ACCESSWORKS/SNA-BASIC for ACCESSWORKS 4300
QP-LBYAA-03	ACCESSWORKS/SNA-BASIC for ACCESSWORKS 4500/4600
QP-LBYAA-04	ACCESSWORKS/SNA-BASIC for ACCESSWORKS 6610/7610

Step 5—ACCESS FOR ORACLE databases

Access to Oracle Databases is provided through RdbAccess for Oracle software.

QL-YQVA9-JC	RdbAccess for Oracle for ACCESSWORKS 3130, 3180
QL-YQVA9-JB	RdbAccess for Oracle for ACCESSWORKS 4000-VLC, 4300
QL-YQVA9-JE	RdbAccess for Oracle for ACCESSWORKS 4100
QL-YQVA9-JK	RdbAccess for Oracle for ACCESSWORKS 4500, 4600
QL-YQVA9-JL	RdbAccess for Oracle for ACCESSWORKS 6610, 7610

Note: Access to remote Oracle databases requires an Oracle SQL*Net license be installed on the ACCESSWORKS server.

Step 6—ACCESSWORKS/DATA-STORE

ACCESSWORKS/DATA-STORE provides the ability to store and manage data at the ACCESSWORKS server.

ACCESSWORKS/DATA-STORE includes

- RDB interactive license
- VAX data distributor license

QP-LBZAA-05	ACCESSWORKS/DATA-STORE for ACCESSWORKS 4000-VLC
QP-LBZAA-01	ACCESSWORKS/DATA-STORE for ACCESSWORKS 3130/80
QP-LBZAA-06	ACCESSWORKS/DATA-STORE for ACCESSWORKS 4100
QP-LBZAA-02	ACCESSWORKS/DATA-STORE for ACCESSWORKS 4300
QP-LBZAA-03	ACCESSWORKS/DATA-STORE for ACCESSWORKS 4500/4600
QP-LBZAA-04	ACCESSWORKS/DATA-STORE for ACCESSWORKS 6610/7610

Note: ACCESSWORKS DATA-STORE requires additional disks sized to customer needs for data storage. See Chapter 7, *Storage Devices*, for disk selection.

Chapter 2
DECsystems

DECstations/DECsystems Comparison Chart

Personal DECstation 5000 Models 20, 25, and 33 Workstations

DECstation 5000 Models 125, 133, and 240 Workstations

DECsystem 5000 Systems and Servers

DECsystem 5900 Systems and Servers

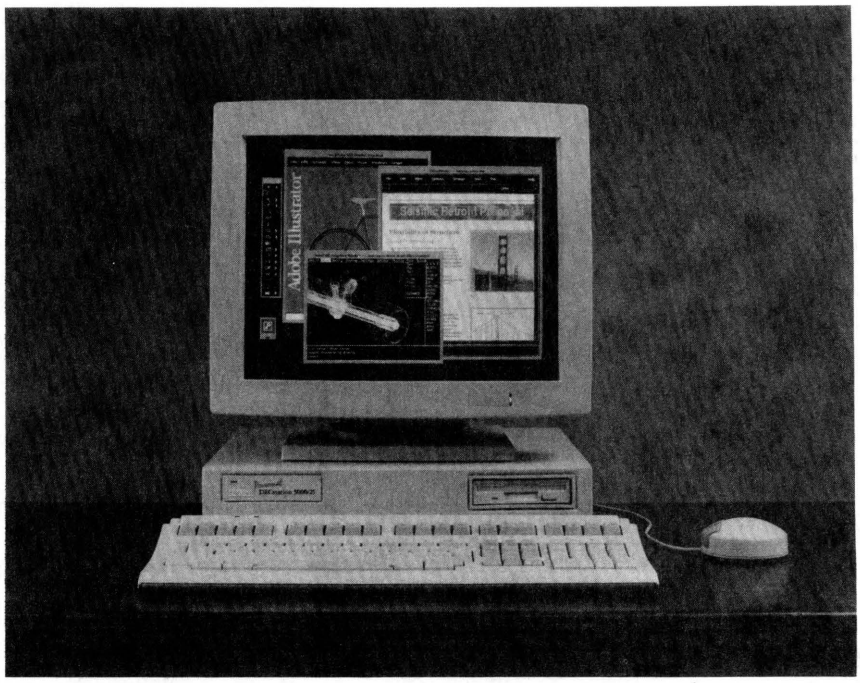
DECstations/DECsystems Comparison Chart

System	Personal DECstation 5000 Models 20/25	DECstation 5000 Models 125/133	DECstation 5000 Model 240	DECsystem 5000 Model 25
CPU[1]/FPU	R3000A/R3010	R3000A/R3010A	R3400B	R3000A/R3010
SPECmark[2]	16.3/19.1	19.3/25.5	32.4	19.1
MIPS[3]	21.6/26.7	26.8/34.4	42.9	26.7
Clock Speed	20 MHz/25 MHz	25 MHz/33 MHz	40 MHz	25 MHz
Cache Size	64 KB (instructions) 64 KB (data)	Model 125: 64 KB (instructions) 64 KB (data) Model 133: 64 KB (instructions) 128 KB (data)	64 KB (instructions) 64 KB (data)	64 KB (instructions) 64 KB (data)
Memory Capacity (type)	8 MB–40 MB (parity)	8 MB–128 MB (parity)	16 MB–480 MB (ECC)	8 MB–40 MB (parity)
Enclosure	Desktop	Desktop	Desktop	Desktop
Storage Capacity				
Internal	Up to 426 MB	Up to 852 MB	None	Up to 426 MB
Total	Up to 25.3 GB	Up to 33.5 GB	Up to 33.1 GB	Up to 25.3 GB
I/O Bus Type	TURBOchannel[4] VME (optional)	TURBOchannel[4] VME (optional)	TURBOchannel[4] VME (optional)	TURBOchannel[4] VME (optional)
Peripheral Support	SCSI VME	SCSI VME	SCSI VME	SCSI VME
Network Support	TCP/IP (standard) NFS (standard) DECnet-ULTRIX (optional) FDDI (optional)	TCP/IP (standard) NFS (standard) DECnet-ULTRIX (optional) FDDI (optional)	TCP/IP (standard) NFS (standard) DECnet-ULTRIX (optional) FDDI (optional)	TCP/IP (standard) NFS (standard) DECnet-ULTRIX (optional) FDDI (optional)

1. From MIPS Computer Systems, Inc.
2. SPECmark is the geometric mean of ten compute-intensive, public-domain benchmarks compared to performance on a VAX-11/780.
3. Million instructions per second based on the Dhrystone benchmarks.
4. Digital and third-party TURBOchannel options are available. Contact a sales representative or Digital reseller for third-party options available through the TRI/ADD program.

DECstations/DECsystems Comparison Chart

System	DECsystem 5000 Model 133	DECsystem 5000 Model 240	DECsystem 5900
CPU[1]/FPU	R3000A/R3010A	R3400B	R3000A/R3010A
SPECmark[2]	25.5	32.4	32.8
MIPS[3]	34.4	42.9	42.9
Clock Speed	33 MHz	40 MHz	40 MHz
Cache Size	64 KB (instructions) 128 KB (data)	64 KB (instructions) 64 KB (data)	64 KB (instructions) 64 KB (data)
Memory Capacity (type)	8 MB–128 MB (parity)	16 MB–480 MB (ECC)	64 MB–448 MB (ECC)
Enclosure	Desktop	Desktop	Cabinet
Storage Capacity			
Internal	Up to 852 MB	None	Up to 37.2 GB
Total	Up to 33.5 GB	Up to 33.1 GB	Up to 37.2 GB
I/O Bus Type	TURBOchannel[4] VME (optional)	TURBOchannel[4] VME (optional)	TURBOchannel[4] VME (optional)
Peripheral Support	SCSI VME	SCSI VME	SCSI VME CI
Network Support	TCP/IP (standard) NFS (standard) DECnet-ULTRIX (optional) FDDI (optional)	TCP/IP (standard) NFS (standard) DECnet-ULTRIX (optional) FDDI (optional)	TCP/IP (standard) NFS (standard) DECnet-ULTRIX (optional) FDDI (optional)



Product Description

The Personal DECstation 5000 Series is Digital's first RISC personal workstation, combining the power of a workstation with the productivity of a PC. This entry-level workstation offers CPU performance of up to 25.3 SPECmarks. The Personal DECstation combines excellent price/performance with a growth path for future higher-performance ACE-compliant CPUs.

The Personal DECstation 5000 Series consists of three products: the Personal DECstation 5000 Model 20, 25, and 33 (20 MHz, 25 MHz, and 33 MHz respectively). All share the same modular design for investment protection. These workstations are UNIX-based RISC systems featuring the MIPS R3000A CPU and R3010 FPU chipset. The design of the Personal DECstation places the CPU/FPU chipset on a 3- × 5-inch (7.6- × 12.7-cm) removable daughter card which permits easy, economical performance upgrades. The R4000 CPU daughter card will be available at a later date.

The Personal DECstation has built-in 8-plane frame buffer graphics, built-in audio, audio clips, and the ability to develop and run multimedia applications. Two TURBOchannel expansion slots allow use of 3D graphics, true-color graphics, high-resolution graphics, live video, specialized networking options (including FDDI networks), serial line expansion, and numerous I/O options.

The system has 8 Mbytes of built-in memory and offers four memory expansion slots. Memory modules are available in 4- and 16-Mbyte packages for system totals of 16 and 40 Mbytes respectively. Internal storage for Models 20 and 25 is provided by two storage cavities. One slot is reserved for a SCSI hard drive; the other slot supports an FDI diskette drive.

The Personal DECstation family is based on industry standards and provides built-in industry-leading openness: open TURBOchannel bus for expansion; X.25 for synchronous communications; EIA-232; SCSI storage; VME expansion; and Floppy Device Interface (FDI).

Product Description
(Continued)

The Personal DECstation's built-in audio, in conjunction with XMedia Tools and the DECvideo/PIP TURBOchannel option, offers customers the flexibility of configuring the system as a low-cost multimedia player system or as a fully functional multimedia developer's system. Digital-designed client/server multimedia software allows developers to implement audio and video applications in a distributed environment. No other vendor offers fully distributed multimedia capability.

Over 2800 RISC ULTRIX applications are available, including an extensive number of personal productivity applications, vertical, 2D and 3D applications with a clear growth path to OSF/1 and ACE-compliance. Of particular interest to customers wanting to break away from the limits of their PC are: Lotus 1-2-3, Wingz, WordPerfect, Island Write, Island Draw, Coral Draw, Adobe Illustrator, Framemaker II, Interleaf TPS, AUTOcad, Applix Asterix, and BBN Slate. For those applications that are not ported, we offer DEC SoftPC V3.0 for ULTRIX that allows a user to run MS-DOS applications in emulation mode on the workstation.

The Personal DECstation offers a wide range of solutions including: demanding business applications, financial trading, technical publishing, electronic computer-aided design (ECAD), multimedia station, low-cost software development platform (CASE), and 3D graphics (MCAD).

Step 1—Systems

Select system. 120-V Packaged and Custom Systems include power cord and U.S. keyboard. 240-V Packaged and Custom Systems require country-specific power cord and keyboard. Custom systems require a monitor for use with built-in 8-plane frame buffer graphics or a TURBOchannel graphics option. Order software from Step 13, if necessary.

No additions or substitutions can be made to a Packaged system. Field-installable options ship separately for installation at customer site. Select factory-installed options for Custom Systems.

Personal DECstation 5000 systems include

- Base module with 20-MHz, 25-MHz, or 33-MHz CPU daughter card
- TURBOchannel I/O interconnect bus—two slots total
- Baseboard frame-buffer graphics 1024 × 768, 72 Hz, 8-plane
- Built-in audio hardware and speaker. Requires Xmedia Runtime License and software to operate audio. Some systems include license, see below.
- Memory (8 or 24 Mbytes)
- Thick wire Ethernet controller on base system module
- Synchronous SCSI controller on base system module
- U.S. keyboard, 120-V systems
- Three-button mouse
- One EIA-232 serial line with full modem control
- 0.9-meter (3-foot) video cable (Packaged systems only)
- 1.8-meter (6-foot) power cord (wall socket to system box, 120-V systems only)
- 0.9-meter (3-foot) convenience power cord (monitor to system box)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- ULTRIX Workstation Software 2-user base license
- User documentation (120 V includes English, 240 V includes international)

Note: Packaged Systems with RZ25 disk and Custom Systems ordered with factory-installed RZ25 variant (-FM) include ULTRIX Factory-Installed Software (FIS).

Packaged Systems

Order Number 120 V/240 V/S.H.	Model/CPU	Memory	Monitor M = Mono C = Color	Graphics	Available TURBO-Channel Slots	RZ25 = 426 MB RX26 = 2.88 MB RRD42 = 600 MB
PM300-SA/SB/SC[1]	20/20 MHz	8 MB	17" M VRM17	8-plane	2	
PM300-SG/SH/SJ[1]	20/20 MHz	8 MB	16" C VRC16	8-plane	2	
PM302-TK/TL/TM[2]	20/20 MHz	8 MB	19" C VRT19	HX 8-plane	1	RZ25, RX26
PM300-AA/AB/AC[1]	25/25 MHz	8 MB	17" M VRM17	8-plane	2	
PM300-AG/AH/AJ[1]	25/25 MHz	8 MB	16" C VRC16	8-plane	2	
PM300-EA/EB/EC[2]	25/25 MHz	8 MB	17" M VRM17	8-plane	2	RZ25, RX26
PM300-EG/EH/EJ[2]	25/25 MHz	8 MB	16" C VRC16	8-plane	2	RZ25, RX26
PM302-EK/EL/EM[2]	25/25 MHz	8 MB	19" C VRT19	HX 8-plane	1	RZ25, RX26
PM305-DG/DH/DJ[2]	25/25 MHz	24 MB	16" C VRT16	PXG+ 8-plane	0	
PM307-LG/LH/LJ[2]	25/25 MHz	24 MB	16" C VRT16	TX 24-plane DECvideo/PIP	1	RZ25, RRD42[3]
PM300-FA/FB/FC[1]	33/33 MHz	8 MB	17" M VRM17	8-plane	2	
PM300-FG/FH/FJ[1]	33/33 MHz	8 MB	16" C VRC16	8-plane	2	
PM302-GK/GL/GM[2]	33/33 MHz	8 MB	19" C VRT19	HX 8-plane	1	RZ25, RX26
PM305-HG/HH/HJ[2]	33/33 MHz	24 MB	16" C VRT16	PXG+ 8-plane	0	
Custom Systems (Require monitor and video cable from Step 3)						
PM310-SX[4]	20/20 MHz	8 MB	Required	8-plane	2	
PM310-AX[4]	25/25 MHz	8 MB	Required	8-plane	2	
PM310-FX[4]	33/33 MHz	8 MB	Required	8-plane	2	

Notes:

1. Requires SCSI cable (BC09D-xx, system box to expansion box) for external storage.
2. Includes Xmedia Runtime License.
3. RRD42 in external expansion box
4. Custom System (PM310-SX,AX,FX) includes 120-V power cord and U.S. keyboard. Systems ordered with country-specific power cord and keyboard ship with international kit.

Step 2—Power Cords and Keyboards (not required for 120-V systems)

Select a power cord and keyboard for all 240-V systems. Power cords connect system to wall socket.

Power Cord and	Keyboard	Country	Language
Included	**Included**	U.S.	English
BN19W-2E	**LK501-AG**	Austria	German/Austrian
BN19K-2E	**LK501-AB**	Belgium	Flemish
BN19K-2E	**LK501-AD**	Denmark	Danish
BN19W-2E	**LK501-AF**	Finland	Suomi
BN19W-2E	**LK501-AP**	France	French
BN19W-2E	**LK501-AG**	Germany	German/Austrian
BN19W-2E	**LK501-AH**	Holland	Dutch
BN19U-2E	**LK501-AT**	Israel	Hebrew
BN19Z-2E	**LK501-AI**	Italy	Italian
BN19W-2E	**LK501-AN**	Norway	Norwegian
BN19W-2E	**LK501-AV**	Portugal	Portuguese
BN19W-2E	**LK501-AS**	Spain	Spanish
BN19W-2E	**LK501-AM**	Sweden	Swedish
BN19E-2E	**LK501-AK**	Switzerland	French
BN19E-2E	**LK501-AL**	Switzerland	German
BN19A-2E	**LK501-AA**	U.K./Ireland	English
BN19H-2E	**LK501-AA**	Australia/NZ	English
BN19P-1K	**LK501-AQ**	U.S./Canada	English
BN19P-1K	**LK501-AC**	Canada	French
	LK501-AJ	Japan	Japanese
	LK501-BH	Greece	Greek
	LK501-BU	Turkey	Turkish Q layout
	LK501-BW	Turkey	Turkish F layout

Step 3—Monitor and Video Cable (required for Custom Systems)

Select monitor and video cable for use with Personal DECstation base graphics. Monitors require a video cable; select 3-foot or 10-foot cable.

			Video Cable	
	Monitor	**Resolution/Refresh Rate**	**3-foot**	**10-foot**
VRM17-AA/A4	17-inch Monochrome	1024 × 768 72 Hz	**BC27M-03**	**17-02878-01**
VRC16-CA/C4	16-inch Color	1024 × 768 72 Hz	**BC29H-2E**	**BC29G-09**

Step 3a—TURBOchannel Graphics Options (Factory/Field Installed)

To configure a high-resolution graphics system, select a TURBOchannel graphics option. Graphics options are listed with compatible monitors.

- Factory-installed PXG, PXG+ or PXGTurbo+ graphics options order with Custom Systems include DEC PHIGS Runtime license and The Personal Visualizer (TPV) license. A Z-Buffer is recommended for all systems running TPV.
- Field-installable PXG, PXG+ and PXGTurbo+ graphics options do not include DEC PHIGS Runtime License and The Personal Visualizer (TPV) license; they must be ordered separately.
- The Personal DECstation only supports the PXGTurbo+ graphics option in the TURBOchannel Extender (TcE) box; see DECstation 5000 Model 240 options.
- Graphics options include 10-foot (3-meter) video cable. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot grayscale monitor cable (17-02878-01).
- TX frame buffer supports an optional DECvideo/Picture-in-Picture (PIP) option card; see TURBOchannel Multimedia options.

Step 3a—TURBOchannel Graphics Options (Factory/Field Installed) *(Continued)*

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitors		Hz
PMAG-AA/AB	MX	1-plane monochrome 1280 × 1024, 72 Hz	1	17" M 19" M	VRM17-AA/A4 VR319-DA/D4	72 72
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz 1280 × 1024, 66 Hz	1	17" M 19" M 16" C 19" C 19" C 16" C	VRM17-AA/A4 VR319-DA/D4 VRT16-HA/H4 VRT19-HA/H4 VR320-DA/D4 VRT16-DA/D4	72 72 72 72 72 66
PMAGB-BE/BF	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz 1024 × 768, 72 Hz	1	17" M 16" C	VRM17-AA/A4 VRC16-CA/C4	72 72
PMAGB-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 72 Hz	1	16" C 19" C 19" C	VRT16-HA/H4 VRT19-HA/H4 VR320-DA/D4	72 72 72
PMAGB-DA/DB	PXG+	8-plane 3D, low- to mid-range 1280 × 1024, 72 Hz	2			
PMAGB-EA/EB	PXG+	24-plane 3D, Z-Buffer, mid-range 1280 × 1024, 72 Hz	2			
PMAGB-FA/FB	PXG Turbo+	96-plane 3D, high performance 1280 × 1024, 72 Hz	3			
PMAG-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 66 Hz	1	16" C 19" C 19" C	VRT16-DA/D4 VRT19-DA/D3/D4 VR320-CA/C4	66 66 66
PMAG-DA/DB	PXG	8-plane 3D, entry level 1280 × 1024, 66 Hz	2			
PMAGB-DC/DD	PXG+	8-plane 3D, low- to mid-range 1280 × 1024, 66 Hz	2			
PMAGB-EC/ED	PXG+	24-plane 3D, mid-range 1280 × 1024, 66 Hz	2			
PMAG-GB		8- to 24-plane upgrade Requires Digital Services installation	0			
PMAG-HA		24-bit Z-Buffer option for PXG, PXG+ and PXGTurbo+ systems	0			

Monitor key: xA/x4: xA = 120-V/240-V Northern Hemisphere, x4 = 240-V Southern Hemisphere.
xA/x3/x4: xA = 120-V Northern Hemisphere, x3 = 240-V Northern Hemisphere,
x4 = 240-V Southern Hemisphere

Step 4—Storage (Factory/Field Installed)

- A single RZ23L or RZ24L disk drive is recommended as data/swap device only.
- One RZ25 disk (426 Mbytes) is recommended for a standalone system.
- Maximum of seven SCSI devices are supported on the base SCSI controller. Select SCSI TURBOchannel option (PMAZ-AA) if more are required.
- Model 25 supports one internal SCSI device with three external expansion boxes.

Step 4a—Internal Drives (Factory/Field Installed)

Models 20 and 25 have two internal storage cavities.

Slot 1—3.5-inch FDI diskette drive RX26
Slot 2—3.5-inch SCSI hard disk, RZ23L, RZ24L, or RZ25

Select maximum of one removable media device

RX26-FP/FN 2.88-Mbyte 3.5-inch internal diskette drive

Step 4a—Internal Drives (Factory/Field Installed) *(Continued)*

Select maximum of one 3.5-inch half-height disk drive. Factory-installed variants (RZ25-FM) include Factory-Installed Software (FIS).

RZ23L-FM/FN	121-Mbyte internal disk drive
RZ24L-FM/FN	245-Mbyte internal disk drive
RZ25-FM/FN	426-Mbyte internal disk drive

To embed a DECstation 2100 or 3100 3.5-inch SCSI disk drive, order hard drive mounting bracket kit.

RZ2X-FN	RZ2X mounting drive bracket kit and documentation

Step 4b—External Drives

Note: Order SCSI cable (BC09D-xx, small connector to large connector) if external storage is to be added to the following systems: PM300-SA/SB/SC, -SG/SH/SJ, -AA/AB/AC, -AG/AH/AJ, -FA/FB/FC, -FG/FH/FJ. All other systems include SCSI cable.

Each SZ12, TLZ06, TKZ08, and RRD42 expansion device includes a SCSI cable. **Note:** External expansion boxes for 240-V systems require a country-specific power cord.

SCSI TURBOchannel Option Card

Base SCSI controller supports seven SCSI devices; maximum of three expansion boxes with one internal device. SCSI TURBOchannel option card supports six additional external SCSI devices in three dual-drive expansion boxes.

PMAZ-AA/AB	SCSI TURBOchannel option card

Single-Drive Expansion Boxes

TLZ06-FA	4.0-Gbyte 4-mm digital audio tape (DAT)
TKZ08-AA	2.2-Gbyte 8-mm tape
RRD42-FA	600-Mbyte compact disc drive

Expansion Boxes (SZ03, SZ12 and SZ16)

For expansion box information see Chapter 7, *Storage Devices*.

TURBOchannel Extender (TcE) Expansion Box

See DECstation 5000 Model 240 Step 4a.

Step 4c—Workstand

H9855-AA	Horizontal workstand. Holds one Personal DECstation system box with three SZ12 expansion boxes. Four mounting wheels included.

Step 5—Memory

System includes 8 Mbytes of memory embedded on system board. Additional memory may be added in 4-Mbyte or 16-Mbyte memory modules. Four memory slots total.

MS01-AA	4-Mbyte parity (2 × 2-Mbyte 1-Mbit DRAM), maximum 16 Mbytes
MS01-CA	16-Mbyte parity (2 × 8-Mbyte 4-Mbit DRAM), maximum 40 Mbytes

Note: MS01-AA modules cannot be mixed with MS01-CA modules. To upgrade from 12 or 16 Mbytes to 24 or 40 Mbytes of memory, MS01-AA SIMMs must be removed and replaced with MS01-CA SIMMs. Digital's DECdirect accepts the return of MS01-AA SIMMs for credit toward MS01-CA SIMMs.

Step 6—Multi-screen TURBOchannel Graphics Options (Factory/Field Installed)

To build a multi-screen system, add appropriate TURBOchannel graphics card and select compatible monitors. Each additional monitor requires a country-specific power cord from Step 2. Although the Personal DECstation 5000 offers two TURBOchannel slots, users can operate three monitors per system by using base graphics with PMAGB-BA/BB or PMAGB-BE/BF HX option only.

- Add a graphics card for each additional monitor. Two or three monitors are supported per system, provided there are free TURBOchannel slots. Supported multi-screen configurations are:
  - Personal DECstation base graphics with one or two HX option cards, (PMAGB-BA/BB or PMAGB-BE/BF) with two or three monitors
  - Two MX option cards with two monitors
  - Two TX option cards with two monitors
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse.
- Monitor cables are included with each graphics option. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot grayscale monitor cable (17-02878-01) for each monitor.

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitors	Hz
PMAG-AA/AB	MX	1-plane monochrome 1280 × 1024, 72 Hz	1	17" M VRM17-AA/A4 19" M VR319-DA/D4	72 72
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz 1280 × 1024, 66 Hz	1	17" M VRM17-AA/A4 19" M VR319-DA/D4 16" C VRT16-HA/H4 19" C VRT19-HA/H4 19" C VR320-DA/D4 16" C VRT16-DA/D4	72 72 72 72 72 66
PMAGB-BE/BF	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz 1024 × 768, 72 Hz	1	17" M VRM17-AA/A4 16" C VRC16-CA/C4	72 72
PMAGB-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 72 Hz	1	16" C VRT16-HA/H4 19" C VRT19-HA/H4 19" C VR320-DA/D4	72 72 72
PMAG-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 66 Hz	1	16" C VRT16-DA/D4 19" C VRT19-DA/D3/D4 19" C VR320-CA/C4	66 66 66

Step 7—TURBOchannel Multimedia Options (Factory/Field Installed)

DECvideo/PIP (Picture-in-Picture)—Does not require TURBOchannel slot

Option card for TX 24-plane color frame buffer, attaches to TX TURBOchannel graphic card

- Provides live NTSC, PAL or SECAM full-motion "video in a window"
- Includes XMedia Tools Runtime Kit License

AV10U-AA/DA DECvideo/Picture-in-Picture option card for TX graphic option

Step 8—TURBOchannel Communications Options (Factory/Field Installed)

Each option requires one TURBOchannel slot

PMAD-AA/AB Thick wire Ethernet TURBOchannel option card
DEFZA-AA DEC FDDIcontroller 700 (fiber optic)
DEFZA-CA DEC FDDIcontroller 700C (copper)

Step 9—Networking Adapters and Miscellaneous Cables

Base system module includes a thick wire Ethernet connector. Two adapters are available: ThinWire or 10BaseT (Twisted Pair).

H3350-AA	10BaseT (Twisted Pair) Ethernet adapter
DESTA-BA	ThinWire Ethernet station adapter

Select desired length of thick wire to connect ThinWire or 10baseT adapter to base system. Do not attach adapter directly to base system module.

BNE4C-xx	Thick wire 802.3/Ethernet cable (xx = 02/05 refers to length in meters)
BNE3H-xx	Thick wire transceiver cable with straight connector—PVC (xx = 05/10/20/40 refers to length in meters)
BNE3L-xx	Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40 refers to length in meters)

Right-angle Ethernet cables are not supported.

BC16M-xx	ThinWire Ethernet cable (xx = 06/15/30 refers to length in feet)

See Chapter 6, *Networks, Communications, and Cables*, for more information.

BC19J-1E	18-inch (45.7-cm) SCSI cable, large connector to large connector (included with each expansion device)
BC19J-03	3-foot (0.9-m) SCSI cable, large connector to large connector
BC19J-06	6-foot (1.8-m) SCSI cable, large connector to large connector
BC09D-03	3-foot (0.9-m) SCSI cable, small connector to large connector (system box to expansion box)
BC09D-06	6-foot (1.8-m) SCSI cable, small connector to large connector; required for Packaged Systems PM300-SA/SB/SC, -SG/SH/SJ, -AA/AB/AC, -AG/AH/AJ, -FA/FB/FC, -FG/FH/FJ; all other systems include a BC09D-06 SCSI cable.

Step 10—Optional Input Devices

Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. Each package includes a power supply, cables, and user documentation.

VSX10-AA/A3	Combination LPFK and PFD package, 120 V/240 V
VSX20-AA/A3	LPFK package, 120 V/240 V
VSX30-AA/A3	PFD package, 120 V/240 V

Models 20, 25, and 33 do not support the tablet at this time.

Step 11—Printers

Refer to Chapter 8, *Terminals and Printers*, for ordering information.

Step 12—CPU Daughter Card Upgrade

Upgrade includes the required upgrade license (QL-VV1AB-TA)

KN02-CC	25-MHz CPU Upgrade for Personal DECstation 5000 Model 20
KN02-DC	33-MHz CPU Upgrade for Personal DECstation 5000 Models 20 and 25

Step 13—Software

ULTRIX V4.2a is required. An ULTRIX media and documentation kit is recommended for the first system on site. ULTRIX kits include documentation, ULTRIX single-user kit, DECwindows, and OSF/Motif software on tape or compact disc.

QA-VV1AA-H5	ULTRIX workstation media (TK50) and documentation kit
QA-VV1AA-H8	ULTRIX workstation media (CD-ROM) and documentation kit

Step 13—Software *(Continued)*

DEC C license is included with ULTRIX V4.2a; order media and documentation separately.

QA-YSJAA-H5	DEC C for RISC ULTRIX media (TK50)
QA-YSJAA-GZ	DEC C for RISC ULTRIX documentation

DEC PHIGS Runtime license is included with Custom Systems ordered with factory-installed PXG, PXG+ and PXGTurbo+ graphics options. Field-installable PXG, PXG+ and PXGTurbo+ graphics options do not include DEC PHIGS Runtime license; order it separately. Order media and documentation kit separately.

QL-VW7AA-AA	DEC PHIGS Runtime license
QL-VW6AA-AA	DEC PHIGS Development license
QA-VW7AA-H5	DEC PHIGS Runtime media (TK50) and documentation kit
QA-VW6AA-H5	DEC PHIGS Development media (TK50) and documentation kit

The Personal Visualizer (TPV) license is included with Custom Systems ordered with factory-installed PXG, PXG+ and PXGTurbo+ graphics options. Field-installable PXG, PXG+ and PXGTurbo+ graphics options do not include The Personal Visualizer (TPV) license; order it separately. A Z-Buffer is recommended for all systems running TPV. Order media and documentation kit separately.

QL-GXZA8-AA	The Personal Visualizer (TPV) license
QA-GXZAA-H5	TPV media (TK50) and documentation kit
QA-GXZAA-GZ	TPV documentation only

The Xmedia Runtime License is included with the Personal DECstation 5000 Model 25 standalone systems; see notes for Packaged Systems. Order media and documentation separately. All other systems require the Xmedia Runtime License and software to operate audio applications. A multimedia developer's kit is also available.

QP-LBDAA-01	Xmedia Tools Runtime License (audio/video)
QB-MB5AA-AA	Xmedia Tools Runtime License (audio/video) and software on TK50
QA-MB4AA-H5	Xmedia tools for RISC ULTRIX on TK50
QB-XUVAA-AA	Xmedia tools full developer's kit on CD-ROM
QB-XUWAA-AA	Xmedia tools full developer's kit (TK50 and CD-ROM)

The following server kit is required if serving VAX systems.

QA-YL5AA-H5	ULTRIX workstation server media (TK50) and documentation kit
QA-YL5AA-H8	ULTRIX workstation server media (CD-ROM) and documentation kit
QA-YL5AA-HM	ULTRIX workstation server media (magtape) and documentation kit

DECnet ULTRIX license must be purchased separately. DECnet media included in ULTRIX V4.2a CD-ROM media kit, but must be ordered separately if ULTRIX V4.2a TK50 media kit is ordered.

QL-YT9AA-AA	DECnet-ULTRIX/RISC license
QA-YT9AA-H5	DECnet-ULTRIX/RISC media (TK50)
QA-YT9AA-GZ	DECnet-ULTRIX/RISC documentation

FORTRAN

QL-VV6AA-AA	FORTRAN for RISC ULTRIX license
QL-VV7AA-AA	FORTRAN for RISC ULTRIX educational license
QA-VV6AA-H5	FORTRAN for RISC ULTRIX media (TK50)
QA-VV6AA-H8	FORTRAN for RISC ULTRIX media (CD-ROM)

Encryption

QL-VV3A8-BA	RISC ULTRIX encryption license
QA-VV3AA-H5	ULTRIX encryption media (TK50) and documentation
QA-VV3AA-H8	ULTRIX encryption media (CD-ROM) and documentation

Step 13—Software *(Continued)*

DEC SoftPC allows RISC ULTRIX systems to run MS-DOS programs with no added hardware. DEC SoftPC runs on both workstations and timesharing systems under ULTRIX.

Customers may test run SoftPC on the Personal DECstation. Order DEC SoftPC loaner kit (QL-YP7A9-xx); loaner kits are available for up to one year.

QL-YP7AC-3B	DEC SoftPC for RISC ULTRIX single-user license
QA-YP7AA-H5	DEC SoftPC for RISC ULTRIX media (TK50)
QA-YP7AA-HM	DEC SoftPC for RISC ULTRIX media (magtape)
QA-YP7AA-GZ	DEC SoftPC for RISC ULTRIX documentation

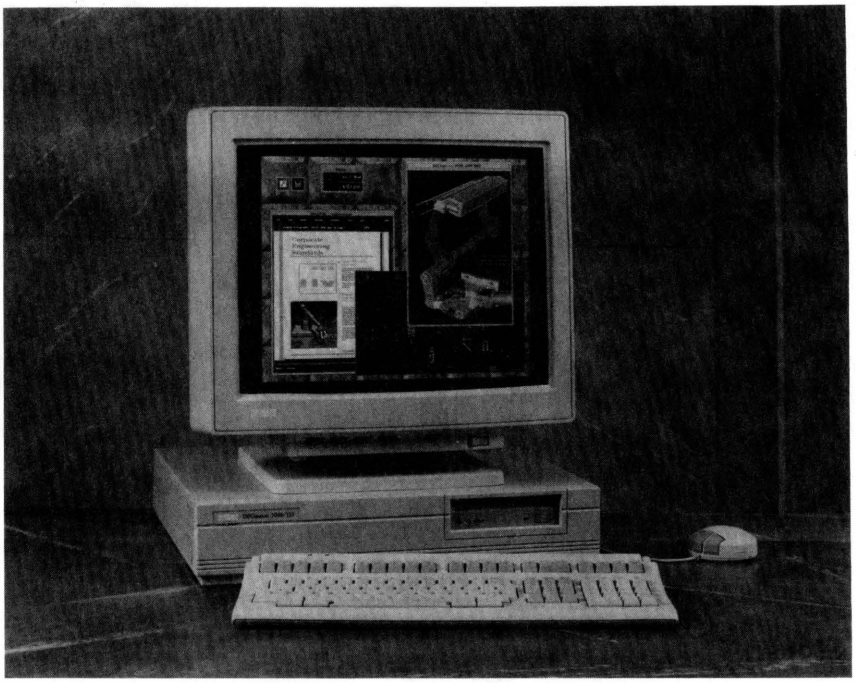
Multiuser Upgrade Licenses

A 2-user license **(QL-VV1AA-BC)** is included with all systems. This only needs to be purchased in special circumstances.

To increase the maximum number of users, select the appropriate license upgrades below.

QL-VV1A8-B5	3- to 8-user upgrade license
QL-VV1A8-B6	9- to 16-user upgrade license
QL-VV1A8-BS	17- to 32-user upgrade license
QL-VV1A8-BT	33- to 64-user upgrade license
QL-VV1A8-B9	65- to unlimited-user upgrade license

See DECstation 5000 specifications on page 2.34 for power requirements, operating environment and physical characteristics information.



Product Description

The DECstation 5000/100 Series of workstations are UNIX-based RISC systems featuring the MIPS R3000A CPU and R3010 FPU chipset. These systems place the CPU/FPU chipset on a 3- × 5-inch (7.6- × 12.7-cm) removable daughter card that permits upgrading the processing power easily. The R4000 CPU daughter card will be available at a later date. Models 125 and 133 offer advanced processing power, graphics power, and expandability in a mid-range workstation. More than 2800 ULTRIX applications are available for the DECstation family.

The DECstation 5000/100 Series offers two systems: Model 125 running at 25 MHz (19.7 SPECmarks) and Model 133 running at 33 MHz (25.3 SPECmarks). Memory modules are available in 4 and 16 Mbytes for system totals of 32 and 128 Mbytes respectively.

Internal storage is provided by three storage cavities. Slot 1 is reserved for one removable media device, and slots 2 and 3 support hard disk drives. The 600-Mbyte compact disc reader enables access to online ULTRIX documentation, CD-based binary distribution, and applications from CD-ROM.

Six graphics subsystems are supported via the TURBOchannel I/O bus, providing a range of solutions from simple 2D to complex 3D graphics, and 24-plane true color. Non-accelerated options and multi-screen displays offer increased end-user productivity by providing two or three simultaneous displays for either color or high-resolution monochrome.

Product Description *(Continued)*

Two TURBOchannel multimedia options are available: DECvideo/PIP (Picture-in-Picture) video, an option card to the TX 24-plane color frame buffer, provides live NTSC, PAL or SECAM full-motion "video in a window." Video windows can be scaled from full size to icon size, and allow individual frames to be grabbed for use in documents or presentations. DECaudio provides telephone-grade audio in and out capabilities. The hardware is ready to support telephony in the U.S. and Canada, CD-quality audio and ISDN at V2 of the Xmedia tools software. DECaudio consists of a TURBOchannel board which has the telephone line and set interface, and an external distribution box with: speaker, amplification, stereo volume/balance control, microphone, headphone and handset jacks; microphone pre-amplification, telephone-grade (8-bit, 8-kHz sampling) line in and out, CD-quality (stereo 16-bit, 44.1-kHz sampling) audio out, ISDN S interface (certification country-specific).

The DECstation 5000/100 Series supports applications ranging from financial trading, and technical publishing to computer-aided software engineering (CASE), mechanical computer-aided design (CAD), electrical computer-aided design (ECAD), scientific modeling, mechanical modeling, scientific visualization, and graphics art design.

Step 1—Systems

Select system. 120-V Packaged Systems include power cord and U.S. keyboard; 120-V Custom Systems include power cord; U.S. keyboard must be ordered separately. 240-V Packaged and Custom Systems require country-specific power cord and keyboard. Order software from Step 13, if necessary.

No additions or substitutions can be made to a Packaged System. Field-installable options ship separately for installation at customer site. Select factory-installed options for Custom Systems.

DECstation 5000 Models 125 and 133 systems include

- Base module with 25-MHz or 33-MHz CPU daughter card
- TURBOchannel I/O interconnect—three slots total
- Memory (8 with 1-Mbit DRAM or 16 Mbytes with 4-Mbit DRAM)
- Thick wire Ethernet controller on base system module
- Synchronous SCSI controller on base system module
- Three-button mouse
- Two EIA-232 serial communication (synchronous/asynchronous) ports
- 3-meter (10-foot) video cable
- 3-meter (10-foot) keyboard/mouse cable
- 1.8-meter (6-foot) SCSI cable (50-pin small connector to 50-pin large connector)
- 0.6-meter (2-foot) SCSI cable (50-pin small connector to 50-pin small connector)
- 1.8-meter (6-foot) power cord (wall socket to system box, 120-V systems only)
- 0.9-meter (3-foot) convenience power cord (monitor to system box)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- ULTRIX Workstation Software, 2-user base license, DEC C and OSF/Motif
- English-language user documentation

Note: Packaged Systems with RZ25 disk and Custom Systems ordered with factory-installed RZ25 variant (-FM) include ULTRIX Factory-Installed Software (FIS).

Packaged Systems

Order Number 120 V/240 V/S.H.	Model/CPU	Memory	Monitor M = Mono C = Color	Graphics	Available TURBO-Channel Slots	RZ25 = 426 MB
PM326-HG/HH/HJ [1]	125/25 MHz	8 MB	19" M VR319	MX 1-plane	Two	
PM326-RG/RH/RJ [1]	133/33 MHz	8 MB	19" M VR319	MX 1-plane	Two	
PM327-SG/SH/SJ [2]	133/33 MHz	16 MB	19" M VR319	HX 8-plane	Two	
PM327-TG/TH/TJ [2]	133/33 MHz	16 MB	19" M VR319	HX 8-plane	Two	426 MB
PM327-SD/SE/SF [2]	133/33 MHz	16 MB	16" C VRT16	HX 8-plane	Two	
PM327-TD/TE/TF [2]	133/33 MHz	16 MB	16" C VRT16	HX 8-plane	Two	426 MB
PM327-SN/SP/SR [2]	133/33 MHz	16 MB	19" C VRT19	HX 8-plane	Two	
PM327-TN/TP/TR [2]	133/33 MHz	16 MB	19" C VRT19	HX 8-plane	Two	426 MB
PM323-SD/SE/SF [2]	133/33 MHz	16 MB	16" C VRT16	PXG [3] 8-plane/3D	One	
Custom Systems (Requires graphic option and monitor from Step 3)						
PM339-HY/HZ [1]	125/25 MHz	8 MB	Required	Required	Three	
PM339-RY/RZ [1]	133/33 MHz	8 MB	Required	Required	Three	
PM339-JY/JZ [2]	125/25 MHz	16 MB	Required	Required	Three	
PM339-SY/SZ [2]	133/33 MHz	16 MB	Required	Required	Three	

Notes:

1. 1-Mbit DRAM memory. Memory may be added in 4-MB increments (MS01-AA) only
2. 4-Mbit DRAM memory. Memory may be added in 16-MB increments (MS01-CA) only
3. System includes DEC PHIGS Runtime license and The Personal Visualizer (TPV) license. A Z-Buffer is recommended for all systems running TPV.

Step 2—Power Cords and Keyboards

120-V Packaged Systems include power cord and U.S. keyboard.

Select U.S. keyboard for 120-V Custom Systems. Select power cord and keyboard for all 240-V systems. Power cords connect system to wall socket.

Note: U.S. Keyboard is required for 120-V Custom Systems.

Power Cord and	Keyboard	Country	Language
Included	**LK401-AA**	U.S.	English
BN19W-2E	**LK401-AG**	Austria	German/Austrian
BN19K-2E	**LK401-AB**	Belgium	Flemish
BN19K-2E	**LK401-AD**	Denmark	Danish
BN19W-2E	**LK401-AF**	Finland	Suomi
BN19W-2E	**LK401-AP**	France	French
BN19W-2E	**LK401-AG**	German	German
BN19W-2E	**LK401-AH**	Holland	Dutch
BN19U-2E	**LK401-AT**	Israel	Hebrew
BN19Z-2E	**LK401-AI**	Italy	Italian
BN19W-2E	**LK401-AN**	Norway	Norwegian
BN19W-2E	**LK401-AV**	Portugal	Portuguese
BN19W-2E	**LK401-AS**	Spain	Spanish
BN19W-2E	**LK401-AM**	Sweden	Swedish
BN19E-2E	**LK401-AK**	Switzerland	French
BN19E-2E	**LK401-AL**	Switzerland	German
BN19A-2E	**LK401-AA**	U.K./Ireland	English
BN19H-2E	**LK401-AA**	Australia/New Zealand	English
BN19P-1K	**LK401-AA**	U.S./Canada	English
BN19P-1K	**LK401-AC**	Canada	French

Step 3—TURBOchannel Graphics Options (Factory/Field Installed)

Custom Systems require graphics option and monitor; select factory-installed variant.

- Factory-installed PXG, PXG+ or PXGTurbo+ graphics options ordered with Custom Systems include DEC PHIGS Runtime license and The Personal Visualizer (TPV) license. A Z-Buffer is recommended for all systems running TPV.
- Field-installable PXG, PXG+ or PXGTurbo+ graphics options do not include DEC PHIGS Runtime license and The Personal Visualizer (TPV) license. They must be ordered separately.
- Graphics options include 10-foot (3-meter) video cable. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot grayscale monitor cable (17-02878-01)
- TX frame buffer supports an optional DECvideo/Picture-in-Picture (PIP) option card; see TURBOchannel Multimedia options.

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitors		Hz
PMAG-AA/AB	MX	1-plane monochrome 1280 × 1024, 72 Hz	1	19" M	VR319-DA/D4	72
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz	1	19" M 16" C 19" C	VR319-DA/D4 VRT16-HA/H4 VRT19-HA/H4	72 72 72
PMAGB-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 72 Hz	1	16" C 19" C 19" C	VRT16-HA/H4 VRT19-HA/H4 VR320-DA/D4	72 72 72
PMAGB-DA/DB	PXG+	8-plane 3D, low- to mid-range 1280 × 1024, 72 Hz	2			
PMAGB-EA/EB	PXG+	24-plane 3D, Z-Buffer, mid-range 1280 × 1024, 72 Hz	2			
PMAGB-FA/FB	PXG Turbo+	96-plane 3D, high performance 1280 × 1024, 72 Hz	3			

Step 3—TURBOchannel Graphics Options (Factory/Field Installed) *(Continued)*

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitors		Hz
PMAG-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 66 Hz	1	16" C 19" C 19" C	VRT16-DA/D4 VRT19-DA/D3/D4 VR320-CA/C4	66 66 66
PMAG-DA/DB	PXG	8-plane 3D, entry level 1280 × 1024, 66 Hz	2			
PMAGB-DC/DD	PXG+	8-plane 3D, low- to mid-range 1280 × 1024, 66 Hz	2			
PMAGB-EC/ED	PXG+	24-plane 3D, mid-range 1280 × 1024, 66 Hz	2			
PMAGB-BC/BD	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz 1024 × 864, 60 Hz	1	19" M 16" C 19" C	VR262-AA/A3/A4 VR297-DA/D3/D4 VR299-DA/D3/D4	60 60 60
PMAG-GB		8- to 24-plane upgrade Requires Digital Services installation	0			
PMAG-HA		24-bit Z-Buffer option for PXG+ and PXGTurbo+ systems	0			

Monitor key: xA/x4: xA = 120-V/240-V Northern Hemisphere, x4 = 240-V Southern Hemisphere.
xA/x3/x4: xA = 120-V Northern Hemisphere, x3 = 240-V Northern Hemisphere,
x4 = 240-V Southern Hemisphere

Step 4—Storage

- A single RZ23L or RZ24L, disk drive is recommended as data/swap device only.
- Recommended configurations for standalone systems are: One RZ25, or two RZ24Ls or one RZ23L and one RZ24L.
- Maximum seven SCSI devices are supported on the base SCSI controller. Select SCSI TURBOchannel option (PMAZ-AA) if more are required.

Step 4a—Internal Drives (Factory/Field Installed)

Models 125 and 133 systems have three internal storage cavities.

Slot 1—Removable media, RX23 or RRD42 or TZK10 or TLZ06
Slot 2—3.5-inch disk, RZ23L, RZ24L or RZ25
Slot 3—3.5-inch disk, RZ23L, RZ24L or RZ25

Select maximum of one removable media device.

RX23-FM/FL 1.4-Mbyte 3.5-inch internal diskette drive
RRD42-FM/FL 600-Mbyte 5.25-inch compact disc drive
TLZ06-FM/FL 4.0-Gbyte digital audio tape (DAT)
TZK10-FM/FL 525-Mbyte 5.25-inch internal quarter inch cartridge (QIC) tape drive

Select maximum of two 3.5-inch half-height disk drives. Factory-installed variants (RZ25-FM) include Factory-Installed Software (FIS).

RZ23L-FM/FL 121-Mbyte 3.5-inch internal disk drive
RZ24L-FM/FL 245-Mbyte 3.5-inch internal disk drive
RZ25-FM/FL 426-Mbyte 3.5-inch internal disk drive

Step 4b—External Drives

Each SZ12, TLZ06, TKZ08, and RRD42 expansion device includes a SCSI cable. **Note:** External expansion boxes for 240-V systems require a country-specific power cord.

SCSI TURBOchannel Option Card

Base SCSI controller supports seven SCSI devices; maximum of three expansion boxes with one internal device. SCSI TURBOchannel option card supports six additional external SCSI devices in three dual-drive expansion boxes.

PMAZ-AA/AB SCSI TURBOchannel option card

Step 4b—External Drives *(Continued)*

Single-Drive Expansion Boxes

TLZ06-FA	4.0-Gbyte 4-mm digital audio tape (DAT)
TKZ08-AA	2.2-Gbyte 8-mm tape
RRD42-FA	600-Mbyte compact disc drive

Expansion Boxes (SZ03, SZ12 and SZ16)

For expansion box information see Chapter 7, *Storage Devices*.

TURBOchannel Extender (TcE) Expansion Box

See DECstation 5000 Model 240 Step 4a.

Step 4c–Workstand

H9855-AA	Horizontal workstand. Holds one DECstation 5000 system box and three SZ12 expansion boxes. Four mounting wheels included.

Step 5—Memory

Additional memory may be added in 4-Mbyte or 16-Mbyte memory modules. Eight memory slots total.

MS01-AA	4-Mbyte parity (2 × 2-Mbyte 1-Mbit DRAM), maximum 32 Mbytes
MS01-CA	16-Mbyte parity (2 × 8-Mbyte 4-Mbit DRAM), maximum 128 Mbytes

Note: MS01-AA modules cannot be mixed with MS01-CA modules.

Step 6—Multi-Screen TURBOchannel Graphics Options (Factory/Field Installed)

To build a multi-screen system, add appropriate TURBOchannel graphics cards and select compatible monitors. Each additional monitor requires a country-specific power cord from Step 2.

- Add a graphics card for each additional monitor. Two or three monitors are supported per system, provided there are free TURBOchannel slots. Supported multi-screen configurations are:
  - Maximum three MX option cards with three monitors
  - Maximum three HX option cards with three monitors
  - Maximum three TX option cards with three monitors
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse.
- Monitor cable included with each graphics option. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot grayscale monitor cable (17-02878-01) for each monitor.

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitors		Hz
PMAG-AA/AB	MX	1-plane monochrome 1280 × 1024 72 Hz	1	19" M	VR319-DA/D4	72
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz	1	19" M 16" C 19" C 19" C	VR319-DA/D4 VRT16-HA/H4 VRT19-HA/H4 VR320-DA/D4	72 72 72 72
		1280 × 1024, 66 Hz		16" C	VRT16-DA/D4	66
PMAGB-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 72 Hz	1	16" C 19" C 19" C	VRT16-HA/H4 VRT19-HA/H4 VR320-DA/D4	72 72 72
PMAG-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 66 Hz	1	16" C 19" C 19" C	VRT16-DA/D4 VRT19-DA/D3/D4 VR320-CA/C4	66 66 66
PMAGB-BC/BD	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz 1024 × 864, 60 Hz	1	19" M 16" C 19" C	VR262-AA/A3/A4 VR297-DA/D3/D4 VR299-DA/D3/D4	60 60 60

Monitor key: xA/x4: xA = 120 V/240 V Northern Hemisphere, x4 = 240 V Southern Hemisphere.
xA/x3/x4: xA = 120 V Northern Hemisphere, x3 = 240 V Northern Hemisphere,
x4 = 240 V Southern Hemisphere

Step 7—TURBOchannel Multimedia Options (Factory/Field Installed)

DECvideo/PIP (Picture-in-Picture)—Does not require TURBOchannel slot.

- Option card for TX 24-plane color frame buffer attaches to TX TURBOchannel graphic card.
- Provides live NTSC, PAL or SECAM full-motion "video in a window"
- Includes Xmedia Tools Runtime Kit license

AV10U-AA/DA DECvideo/Picture-in-Picture option card for TX graphic option

DECaudio—Requires one TURBOchannel slot

- Audio/signal processing TURBOchannel card
- Provides telephone-grade audio in and out capabilities; hardware ready to support telephony in U.S. and Canada, CD-quality audio and ISDN at V2 of the Xmedia tools software.
- Includes Xmedia Tools Runtime Kit license

AV01B-AA/DA DECaudio TURBOchannel card and distribution box

Step 8—TURBOchannel Communications Options (Factory/Field Installed)

Each option requires one TURBOchannel slot

PMAD-AA/AB Thick wire Ethernet TURBOchannel option card
DEFZA-AA DEC FDDIcontroller 700 (fiber optic)
DEFZA-CA DEC FDDIcontroller 700C (copper)

Step 9—Networking Adapters and Miscellaneous Cables

Base system module includes thick wire Ethernet connector. Two adapters are available, ThinWire or 10BaseT (Twisted Pair):

H3350-AA 10BaseT (Twisted Pair) Ethernet adapter
DESTA-BA ThinWire Ethernet station adapter

Select desired length of thick wire to connect ThinWire or 10BaseT adapter to base system. Do not attach adapter directly to base system module.

BNE4C-xx Thick wire 802.3/Ethernet cable (xx = 02/05 refers to length in meters)
BNE3H-xx Thick wire transceiver cable with straight connector—PVC (xx = 05/10/20/40 refers to length in meters)
BNE3L-xx Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40 refers to length in meters)

Right-angle Ethernet cables are not supported.

BC16M-xx ThinWire Ethernet cable (xx = 06/15/30 refers to length in feet)

See Chapter 6, *Networks, Communications, and Cables,* for more information.

BC19J-1E 18-inch (45.7-cm) SCSI cable, large connector to large connector (included with each expansion device)
BC19J-03 3-foot (0.9-m) SCSI cable, large connector to large connector
BC19J-06 6-foot (1.8-m) SCSI cable, large connector to large connector
BC09D-03 3-foot (0.9-m) SCSI cable, small connector to large connector (system box to expansion box)
BC09D-06 6-foot (1.8-m) SCSI cable, small connector to large connector (included with each system)

Step 10—Optional Input Devices

Tablet can be used in place of the mouse. Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. Each package includes a power supply, cables, and user documentation.

VSXXX-AB 11- × 11-inch (28- x 28-cm) tablet with a 2-button stylus and a 4-button puck
VSX10-AA/A3 Combination LPFK and PFD package, 120 V/240 V
VSX20-AA/A3 LPFK package, 120 V/240V
VSX30-AA/A3 PFD package, 120 V/240V

Step 11—Printers

Refer to Chapter 8, *Terminals and Printers,* for ordering information.

Step 12—CPU Daughter Card Upgrade

CPU daughter card upgrades include required upgrade licenses (QL-VV1AB-TA--ULTRIX Workstation Software and QL-YT9AB-GA--DECnet-ULTRIX license)

KN02-CC	25-MHz CPU Upgrade for DECstation 5000 Model 120
KN02-DC	33-MHz CPU Upgrade for DECstation 5000 Model 120 and 125

Step 13—Software

ULTRIX V4.2a is required. An ULTRIX media and documentation kit is recommended for the first system on site. ULTRIX kits include documentation, ULTRIX single-user kit, DECwindows, and OSF/Motif software on tape or compact disc.

QA-VV1AA-H5	ULTRIX workstation media (TK50) and documentation kit
QA-VV1AA-H8	ULTRIX workstation media (CD-ROM) and documentation kit

DEC C license is included with ULTRIX V4.2a; order media and documentation separately.

QA-YSJAA-H5	DEC C for RISC ULTRIX media (TK50)
QA-YSJAA-GZ	DEC C for RISC ULTRIX documentation

DEC PHIGS Runtime license is included with PXG Packaged System and Custom Systems ordered with factory-installed PXG, PXG+ and PXGTurbo+ graphics options. Field installable PXG, PXG+ and PXGTurbo+ graphics options do not include DEC PHIGS Runtime license, order separately. Order media and documentation separately.

QL-VW7AA-AA	DEC PHIGS Runtime license
QL-VW6AA-AA	DEC PHIGS Development license
QA-VW7AA-H5	DEC PHIGS Runtime media (TK50) and documentation kit
QA-VW6AA-H5	DEC PHIGS Development media (TK50) and documentation kit

The Personal Visualizer (TPV) license is included with a PXG Packaged System and Custom Systems ordered with factory-installed PXG, PXG+ AND PXGTurbo+ graphics options. Field-installable PXG, PXG+ and PXGTurbo+ graphics options do not include The Personal Visualizer (TPV) license; order it separately. A Z-Buffer is recommended for all systems running TPV. Order media and documentation separately.

QL-GXZA8-AA	The Personal Visualizer (TPV) license
QA-GXZAA-H5	TPV media (TK50) and documentation kit
QA-GXZAA-GZ	TPV documentation only

Xmedia Runtime (Multimedia Software)

Xmedia Runtime license included with DECvideo/PIP and DECaudio options. Media and documentation must be ordered separately.

QP-LBDAA-01	Xmedia Tools Runtime license (audio/video)
QB-MB5AA-AA	Xmedia Tools Runtime license (audio/video) and software on TK50
QA-MB4AA-H5	Xmedia tools for RISC ULTRIX on (TK50)
QB-XUVAA-AA	Xmedia tools full developer's kit on CD-ROM
QB-XUWAA-AA	Xmedia tools full developer's kit (TK50 and CD-ROM)

The following server kit is required only if serving VAX systems.

QA-YL5AA-H5	ULTRIX workstation server media (TK50) and documentation kit
QA-YL5AA-H8	ULTRIX workstation server media (CD-ROM) and documentation kit
QA-YL5AA-HM	ULTRIX workstation server media (magtape) and documentation kit

Step 13—Software *(Continued)*

DECnet ULTRIX license must be purchased separately. DECnet media included in ULTRIX V4.2a CD-ROM media kit, but must be ordered separately if ULTRIX V4.2a TK50 media kit is ordered.

QL-YT9AA-AA	DECnet-ULTRIX/RISC license
QA-YT9AA-H5	DECnet-ULTRIX/RISC media (TK50)
QA-YT9AA-GZ	DECnet-ULTRIX/RISC documentation

FORTRAN

QL-VV6AA-AA	FORTRAN for RISC ULTRIX license
QL-VV7AA-AA	FORTRAN for RISC ULTRIX educational license
QA-VV6AA-H5	FORTRAN for RISC ULTRIX media (TK50)
QA-VV6AA-H8	FORTRAN for RISC ULTRIX media (CD-ROM)

Encryption

QL-VV3A8-BA	ULTRIX (RISC) encryption license
QA-VV3AA-H5	ULTRIX encryption media (TK50) and documentation
QA-VV3AA-H8	ULTRIX encryption media (CD-ROM) and documentation

DEC SoftPC allows RISC ULTRIX systems to run MS-DOS programs with no added hardware. DEC SoftPC runs on both workstations and timesharing systems under ULTRIX.

QL-YP7AC-3B	DEC SoftPC for RISC ULTRIX single-user license
QA-YP7AA-H5	DEC SoftPC for RISC ULTRIX media (TK50)
QA-YP7AA-HM	DEC SoftPC for RISC ULTRIX media (magtape)
QA-YP7AA-GZ	DEC SoftPC for RISC ULTRIX documentation

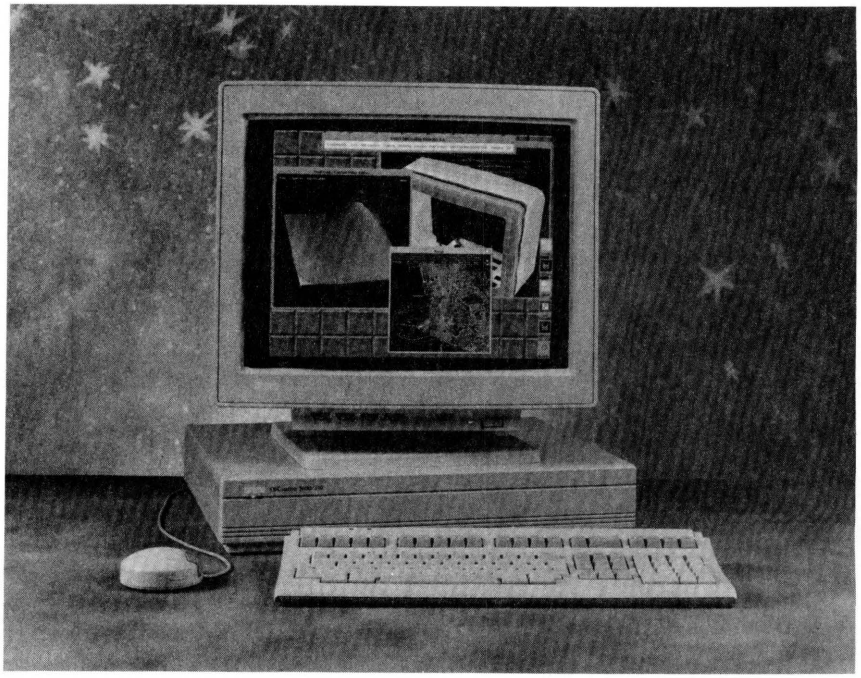
Multiuser Upgrade Licenses

A 2-user license is included with all systems. To increase the maximum number of users, select the appropriate license upgrades below.

QL-VV1A8-B5	3- to 8-user upgrade license
QL-VV1A8-B6	9- to 16-user upgrade license
QL-VV1A8-BS	17- to 32-user upgrade license
QL-VV1A8-BT	33- to 64-user upgrade license
QL-VV1A8-B9	65- to unlimited-user upgrade license

See DECstation 5000 specifications on page 2.34 for power requirements, operating environment and physical characteristics information.

DECstation 5000 Model 240



Product Description

The DECstation 5000/240 is a high-performance RISC/UNIX workstation, designed to extend the performance envelope of the DECstation family. It provides superb across-the-spectrum performance in all areas of workstation computation (graphics, I/O, integer and floating point, and network throughput) in a compact, low-cost desktop package. It maintains full and complete binary compatibility with all other Digital RISC systems.

The innovative design of the DECstation 5000 Model 240 extends the performance of the DECstation family to 32.4 SPECmarks. The Model 240 incorporates a CPU daughter card design similar to the DECstation 5000 Model 100 series, which provides significant long-term investment protection. The R4000 CPU daughter card will be available at a later date. NFS performance is increased by up to 300 percent with the addition of a Prestoserve option, and new DMA I/O controllers substantially improve on-board SCSI and Ethernet performance.

Four new graphics options are available: HX, TX, PXG+ and PXGTurbo+.

- The HX (Smart Frame Buffer) is a single-width 2D graphics option delivering up to four times the performance of the 200CX systems, This option is the best choice for color graphics that do not require extensive 3D object manipulation, and is suitable for all 2D (ECAD, GIS, 2D Mechanical Design and Drafting) and many simpler 3D applications, such as AutoCAD.
- TX True Color Frame Buffer provides affordable 24-plane color with an optional "video-in-a-window" option card. It is targeted at applications such as desktop publishing or imaging, which require true color but no graphic acceleration.
- PXG+ is an 8- or 24-plane 3D graphics option with an 8- or 24-plane double buffer offering a 33 percent performance improvement over PXG graphics. PXG+ supports applications doing simpler 3D design, modeling, and rendering using wireframes and simple 3D solids cost effectively. A Z-Buffer is now standard on the 24-plane version.
- PXG Turbo+ is a 96-plane, 3D graphics subsystem designed for customers who need both maximum performance and functionality for applications in advanced 3D solids, animation and rendering.

Product Description
(Continued)

All new graphics options are supported on 16-inch or 19-inch Sony monitors with 1280 × 1024 resolution, operating at 72 Hz.

The TURBOchannel Extender (TcE) enclosure, a peripheral box designed to contain a TURBOchannel Extender as well as up to two half-height internal drives (RZ25) and one half-height removable device (CD-ROM). The TcE is supported on all TURBOchannel-based systems. The TURBOchannel Extender allows the use of a dual- or triple-width TURBOchannel card such as a PXG+ or PXGTurbo+ graphics card without restricting the use of the two remaining TURBOchannel slots.

As part of the DECstation family, the Model 240 is able to take advantage of the more than 2,800 existing RISC ULTRIX applications and large third-party TURBOchannel device portfolio (IPI disks controllers, large frame buffers, array processors, etc.).

Step 1—Systems

Select system. 120-V Packaged and Custom Systems include power cord and U.S. keyboard. 240-V Packaged and Custom Systems require country-specific power cord and keyboard. Order software from Step 12, if necessary.

No additions or substitutions can be made to a Packaged System. Field-installable options ship separately for installation at customer site. Select factory-installed options for Custom Systems.

DECstation 5000 Model 240 systems include

- Base module with 40-MHz CPU daughter card
- TURBOchannel I/O interconnect—three slots total
- Memory (16 or 24 Mbytes using 1-Mbit DRAM, or 32 Mbytes using 4-Mbit DRAM)
- Thick wire Ethernet controller on Base System module
- Synchronous SCSI controller on Base System module
- U.S. keyboard, 120-V systems
- Three-button mouse
- Two EIA-232 serial communication (synchronous/asynchronous) ports
- 3-meter (10-foot) video cable
- 3-meter (10-foot) keyboard/mouse cable
- 1.8-meter (6-foot) SCSI cable (50-pin small connector to 50-pin large connector)
- 0.6-meter (2-foot) SCSI cable (50-pin small connector to 50-pin small connector)
- 1.8-meter (6-foot) power cord (wall socket to system box, 120-V systems only)
- 0.9-meter (3-foot) convenience power cord (monitor to system box)
- Universal Power Supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- ULTRIX Workstation Software 2-user base license, DEC C and OSF/Motif
- English-language user documentation

Packaged Systems

Order Number 120 V/240 V/S.H.	Model/CPU	Memory	Monitor M = Mono C = Color	Graphics	Available TURBO-Channel Slots	TcE Box with RZ25 = 426 MB CD-ROM = 600 MB
PM380-AD/AE/AF	240/40 MHz	16 MB [1]	19" M VR319	MX 1-plane	Two	
PM381-AD/AE/AF	240/40 MHz	16 MB [1]	19" G VR319	HX 8-plane	Two	
PM381-AG/AH/AJ	240/40 MHz	16 MB [1]	16" C VRT16	HX 8-plane	Two	
PM381-AK/AL/AM	240/40 MHz	16 MB [1]	19" C VRT19	HX 8-plane	Two	
PM382-AK/AL/AM	240/40 MHz	16 MB [1]	19" C VRT19	TX 24-plane/2D	Two	
PM383-BG/BH/BJ [3]	240/40 MHz	24 MB [1]	16" C VRT16	PXG+ 8-plane/3D	One	
PM383-BK/BL/BM [3]	240/40 MHz	24 MB [1]	19" C VRT19	PXG+ 8-plane/3D	One	
PM384-BK/BL/BM [3]	240/40 MHz	24 MB [1]	19" C VRT19	PXG+ 24-plane/3D Z-Buffer	One	
PM384-TK/TL/TM [3]	240/40 MHz	24 MB [1]	19" C VRT19	PXG+ 24-plane/3D Z-Buffer	Two	2 × 426 MB 1 × 600 MB
PM385-BK/BL/BM [3]	240/40 MHz	24 MB [1]	19" C VRT19	PXG 96-plane/3D Turbo+	Zero	
PM385-TK/TL/TM [3]	240/40 MHz	24 MB [1]	19" C VRT19	PXG 96-plane/3D Turbo+	Two	2 × 426 MB 1 × 600 MB
Custom Systems (Require graphics option and monitor)						
PM390-AY/AZ	240/40 MHz	16 MB [1]	Required	Required	Three	
PM390-CY/CZ	240/40 MHz	32 MB [2]	Required	Required	Three	

Notes:

1. 1-Mbit DRAM memory. Memory may be added in 8-MB increments (MS02-AA) only.
2. 4-Mbit DRAM memory. Memory may be added in 32-MB increments (MS02-CA) only.
3. Systems include DEC PHIGS Runtime license and The Personal Visualizer (TPV) license. A Z-Buffer is recommended for all systems running TPV.

Step 2–Power Cords and Keyboards (not required for 120-V systems)

Select power cord and keyboard for all 240-V systems. Power cords connect system to wall socket.

Power Cord	and	Keyboard	Country	Language
Included		**Included**	U.S.	English
BN19W-2E		**LK401-AG**	Austria	German/Austrian
BN19K-2E		**LK401-AB**	Belgium	Flemish
BN19K-2E		**LK401-AD**	Denmark	Danish
BN19W-2E		**LK401-AF**	Finland	Suomi
BN19W-2E		**LK401-AP**	France	French
BN19W-2E		**LK401-AG**	German	German
BN19W-2E		**LK401-AH**	Holland	Dutch
BN19U-2E		**LK401-AT**	Israel	Hebrew
BN19Z-2E		**LK401-AI**	Italy	Italian
BN19W-2E		**LK401-AN**	Norway	Norwegian
BN19W-2E		**LK401-AV**	Portugal	Portuguese
BN19W-2E		**LK401-AS**	Spain	Spanish
BN19W-2E		**LK401-AM**	Sweden	Swedish
BN19E-2E		**LK401-AK**	Switzerland	French
BN19E-2E		**LK401-AL**	Switzerland	German
BN19A-2E		**LK401-AA**	U.K./Ireland	English
BN19H-2E		**LK401-AA**	Australia/NZ	English
BN19P-1K		**LK401-AA**	U.S./Canada	English
BN19P-1K		**LK401-AC**	Canada	French

Step 3—TURBOchannel Graphics Options (Factory/Field Installed)

Custom Systems require graphics option and monitor; select factory-installed variant.

- Factory-installed PXG+ or PXGTurbo+ graphics options ordered with Custom Systems include DEC PHIGS Runtime license and The Personal Visualizer (TPV) license. A Z-Buffer is recommended for all systems running TPV.
- Field-installable PXG+ or PXGTurbo+ graphics options do not include DEC PHIGS Runtime license and The Personal Visualizer (TPV) license; they must be ordered separately.
- Graphics options include 10-foot (3-meter) video cable. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot grayscale monitor cable (17-02878-01).
- TX frame buffer supports an optional DECvideo/Picture-in-Picture (PIP) option card; see TURBOchannel Multimedia options.

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitors		Hz
PMAG-AA/AB	MX	1-plane monochrome 1280 × 1024, 72 Hz	1	19" M	VR319-DA/D4	72
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz	1	19" M 16" C 19" C	VR319-DA/D4 VRT16-HA/H4 VRT19-HA/H4	72 72 72
PMAGB-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 72 Hz	1	16" C 19" C	VRT16-HA/H4 VRT19-HA/H4	72 72
PMAGB-DA/DB	PXG+	8-plane 3D, low- to mid-range 1280 × 1024, 72 Hz	2			
PMAGB-EA/EB	PXG+	24-plane 3D, Z-Buffer, mid-range 1280 × 1024, 72 Hz	2			
PMAGB-FA/FB	PXG Turbo+	96-plane 3D, high performance 1280 × 1024, 72 Hz	3			

Step 3—TURBOchannel Graphics Options (Factory/Field Installed) *(Continued)*

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitors		Hz
PMAG-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 66 Hz	1	16" C 19" C 19" C	VRT16-DA/D4 VRT19-DA/D3/D4 VR320-CA/C4	66 66 66
PMAGB-DC/DD	PXG+	8-plane 3D, low- to mid-range 1280 × 1024, 66 Hz	2			
PMAGB-EC/ED	PXG+	24-plane 3D, mid-range 1280 × 1024, 66 Hz	2			
PMAGB-BC/BD	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz; 1024 × 864, 60 Hz	1	19" M 16" C 19" C	VR262-AA/A3/A4 VR297-DA/D3/D4 VR299-DA/D3/D4	60 60 60
PMAG-GB		8- to 24-plane upgrade Requires Digital Services installation	0			
PMAG-HA		24-bit Z-Buffer option for PXG+ and PXGTurbo+ systems	0			

Monitor key: xA/x4: xA = 120-V/240-V Northern Hemisphere, x4 = 240-V Southern Hemisphere. xA/x3/x4: xA = 120-V Northern Hemisphere, x3 = 240-V Northern Hemisphere, x4 = 240-V Southern Hemisphere

Step 4—Storage

Internal storage is not supported in the DECstation 5000 Model 240.

Maximum of six external SCSI devices supported on base SCSI controller, resulting in maximum of three SZ12 expansion boxes. Select SCSI TURBOchannel option (PMAZ-AA) if more are required. Each SZ12, TLZ06, TKZ08, and RRD42 expansion device includes a SCSI cable. **Note:** External expansion boxes for 240-V systems require a country specific power cord.

SCSI TURBOchannel Option Card

SCSI TURBOchannel option card supports six additional external SCSI devices in three dual-drive expansion boxes.

PMAZ-AA/AB SCSI TURBOchannel option card

Single-Drive Expansion Boxes

TLZ06-FA 4.0-Gbyte 4-mm digital audio tape (DAT)
TKZ08-AA 2.2-Gbyte 8-mm tape
RRD42-FA 600-Mbyte compact disc drive
TSZ07-CA 40-Mbyte/140-Mbyte SCSI 9-track tape at 1600/6250 bits/inch. Must order U.S./Canada country kit (TSZK7-AA).
RW100-AA 19-Gbyte StorageServer 100 deskside base option, TK50 media
RW100-BA 19-Gbyte StorageServer 100 deskside base option, CD-ROM media
RW100-CA 19-Gbyte StorageServer 100 deskside base option

Expansion Boxes (SZ03, SZ12 and SZ16)

For expansion box information see Chapter 7, *Storage Devices*.

Step 4a—TcE Expansion Box

Note: Model 25 requires 61-cm (2-foot) SCSI cable (small connector to small connector, **17-TCESC-01**) to connect TcE to system box. Cable is not required if TcE is daisychained to another expansion box. DECstation 5000 Models 133 and 240 include 61-cm (2-foot) SCSI cable.

TURBOchannel Extender (TcE) box supports TURBOchannel extender and three half-height devices: one half-height removable device and two half-height hard drives. TcE includes base connector card and cable, SCSI cable, and 120-V power cord.

- Select TcE expansion box when dual- or triple-width TURBOchannel cards are required.
- System supports maximum of three TcE boxes, one per TURBOchannel slot.
- TcE can be daisychained with other external storage devices but must be last device in chain.
- 240-V devices require a country-specific power cord.

PMTCE-AA TcE, no options, no disks
PMTCE-DA TcE, PXG+ 8 planes, no disks
PMTCE-EA TcE, PXG+ 24 planes, no disks
PMTCE-FA TcE, PXGTurbo+, no disks
PMTCE-LA TcE, PXG+ Two RZ25s (852-Mbyte), one CD-ROM
PMTCE-MA TcE, PXGTurbo+ Two RZ25s (852-Mbyte), one CD-ROM

Step 4a—TcE Expansion Box *(Continued)*

Additional SCSI devices may be purchased separately and are customer installable. The following SCSI devices are supported in TcE expansion box.

RZ23L-FL	121-Mbyte internal disk drive
RZ24L-FL	245-Mbyte internal disk drive
RZ25-FL	426-Mbyte internal disk drive
TZK10-FL	525-Mbyte internal quarter inch cartridge (QIC) tape drive
RX23-FL	1.4-Mbyte internal diskette drive
RRD42-FL	CD-ROM internal compact disc drive

Note: TcE allows for full use of all three TURBOchannel slots while incorporating dual- or triple-width cards. It does not permit the connection of more than three TURBOchannel option cards.

Step 4b—Workstand

H9855-AA	Horizontal workstand. Holds one DECstation 5000 system box and three SZ12 expansion boxes. Four mounting wheels included.

Step 5—Memory

Additional memory may be added in 8-Mbyte or 32-Mbyte memory modules. Fifteen memory slots total.

MS02-AA	8-Mbyte ECC memory (1-Mbit DRAM), maximum 120 Mbytes
MS02-CA	32-Mbyte ECC memory (4-Mbit DRAM), maximum 480 Mbytes

Prestoserve Option—must be placed in 15th memory slot (slot number 14). Prestoserve reduces maximum memory to 112 Mbytes using 1-Mbit DRAMs and 448 Mbytes using 4-Mbit DRAMs.

DJ-523PS-AA	Includes 1-MByte cache RAM module and software license

Note: MS02-AA modules cannot be mixed with MS02-CA modules.

Step 6—Multi-Screen TURBOchannel Graphics Options (Factory/Field Installed)

To build a multi-screen system, add appropriate TURBOchannel graphics cards and select compatible monitors. Each additional monitor requires a country-specific power cord from Step 2.

- Add graphics card for each additional monitor. Two or three monitors are supported per system, provided there are free TURBOchannel slots. Supported multi-screen configurations are:
  - Maximum three MX option cards with three monitors
  - Maximum three HX option cards with three monitors
  - Maximum three TX option cards with three monitors
- Multi-screen systems expand monitor area. They are single-user systems, with one keyboard and one mouse.
- Monitor cables included with each graphics option. The HX option includes a color cable. To run HX grayscale graphics on a monochrome monitor, order 10-foot (3-meter) grayscale monitor cable (17-02878-01) for each monitor.

Order Number Factory/Field Installed		Graphics Options	TURBOchannel Slots Required	Compatible Monitors		Hz
PMAG-AA/AB	MX	1-plane monochrome 1280 × 1024, 72 Hz	1	19" M	VR319-DA/D4	72
PMAGB-BA/BB	HX	8-plane color/grayscale 2D Smart Frame	1	19" M	VR319-DA/D4	72
				16" C	VRT16-HA/H4	72
		1280 × 1024, 72 Hz		19" C	VRT19-HA/H4	72
PMAGB-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 72 Hz	1	16" C	VRT16-HA/H4	72
				19" C	VRT19-HA/H4	72
				19" C	VR320-DA/D4	72
PMAG-JA/JB	TX	24-plane true color frame buffer non-accelerated 1280 × 1024, 66 Hz	1	16" C	VRT16-DA/D4	66
				19" C	VRT19-DA/D3/D4	66
				19" C	VR320-CA/C4	66
PMAGB-BC/BD	HX	8-plane color/grayscale 2D Smart Frame 1280 × 1024, 72 Hz 1024 × 864, 60 Hz	1	19" M	VR262-AA/A3/A4	60
				16" C	VR297-DA/D3/D4	60
				19" C	VR299-DA/D3/D4	60

Monitor key: xA/x4: xA = 120 V/240-V Northern Hemisphere, x4 = 240-V Southern Hemisphere.
xA/x3/x4: xA = 120-V Northern Hemisphere, x3 = 240-V Northern Hemisphere,
x4 = 240-V Southern Hemisphere

Step 7—TURBOchannel Multimedia Options (Factory/Field Installed)

DECvideo/PIP (Picture-in-Picture)—Does not require TURBOchannel slot

- Option card for TX 24-plane color frame buffer, attaches to TX TURBOchannel graphic card.
- Provides live NTSC, PAL or SECAM full-motion "video in a window"
- Includes Xmedia Tools Runtime Kit license

AV10U-AA/DA DECvideo/Picture-in-Picture option card for TX graphic option

DECaudio—Requires one TURBOchannel slot

- Audio/signal processing TURBOchannel card
- Provides telephone-grade audio in and out capabilities; hardware ready to support telephony in U.S. and Canada, CD-quality audio and ISDN at V2 of the Xmedia tools software.
- Includes Xmedia Tools Runtime Kit license

AV01B-AA/DA DECaudio TURBOchannel card and distribution box

Step 8—TURBOchannel Communications Options (Factory/Field Installed)

Each option requires one TURBOchannel slot.

PMAD-AA/AB Thick wire Ethernet TURBOchannel option card
DEFZA-AA DEC FDDIcontroller 700 (fiber optic)
DEFZA-CA DEC FDDIcontroller 700C (copper)

Step 9—Networking Adapters and Miscellaneous Cables (Field Installable)

Base system module includes thick wire Ethernet connector. Two adapters are available, ThinWire or 10BaseT (Twisted Pair).

H3350-AA 10BaseT (Twisted Pair) Ethernet adapter
DESTA-BA ThinWire Ethernet station adapter

Select desired length of thick wire to connect ThinWire or 10BaseT adapter to base system. Do not attach adapter directly to base system module.

BNE4C-xx Thick wire 802.3/Ethernet cable (xx = 02/05 refers to length in meters)
BNE3H-xx Thick wire transceiver cable with straight connector—PVC (xx = 05/10/20/40 refers to length in meters)
BNE3L-xx Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40 refers to length in meters)

Right-angle Ethernet cables are not supported.

BC16M-xx ThinWire Ethernet cable (xx = 06/15/30 refers to length in feet)

See Chapter 6, *Networks, Communications, and Cables,* for more information.

BC19J-1E 18-inch (45.7-cm) SCSI cable, large connector to large connector (included with each expansion device)
BC19J-03 3-foot (0.9-meter) SCSI cable, large connector to large connector
BC19J-06 6-foot (1.8-meter) SCSI cable, large connector to large connector
BC09D-03 3-foot (0.9-m) SCSI cable, small connector to large connector (system box to expansion box)
BC09D-06 6-foot (1.8-meter) SCSI cable, small connector to large connector (included with each system)

Step 10—Optional Input Devices

Tablet can be used in place of the mouse. Lighted Programmable Function Keyboard (LPFK) and Programmable Function Dials (PFD) can be ordered as a pair or separately. LPFK and PFD packages listed below include a Peripheral Control Module (PCM) which provides multiplexing of both LPFK and PFD into a single EIA-232 port. Each package includes a power supply, cables, and user documentation.

VSXXX-AB 28- × 28-cm (11- × 11-inch) tablet with a 2-button stylus and a 4-button puck
VSX10-AA/A3 Combination LPFK and PFD package, 120 V/240 V
VSX20-AA/A3 LPFK package, 120 V/240 V
VSX30-AA/A3 PFD package, 120 V/240 V

Step 11—Printers

Refer to Chapter 8, *Terminals and Printers*, for ordering information.

Step 12—Software

ULTRIX V4.2a is required. An ULTRIX media and documentation kit is recommended for first system on site. ULTRIX kits include documentation, ULTRIX single-user kit, DECwindows, and OSF/Motif software on tape or compact disc.

QA-VV1AA-H5	ULTRIX workstation media (TK50) and documentation kit
QA-VV1AA-H8	ULTRIX workstation media (CD-ROM) and documentation kit

DEC C license is included with ULTRIX V4.2a, order media and documentation separately.

QA-YSJAA-H5	DEC C for RISC ULTRIX (TK50)
QA-YSJAA-GZ	DEC C for RISC ULTRIX documentation

DEC PHIGS Runtime license is included with PXG+ and PXGTurbo+ Packaged Systems and Custom Systems ordered with factory-installed PXG+ and PXGTurbo+ graphics options. Field-installable PXG+ and PXGTurbo+ graphics options do not include DEC PHIGS Runtime license; order it separately. Order media and documentation separately.

QL-VW7AC-AA	DEC PHIGS Runtime license
QL-VW6AC-AA	DEC PHIGS Development license
QA-VW7AA-H5	DEC PHIGS Runtime media (TK50) and documentation kit
QA-VW6AA-H5	DEC PHIGS Development media (TK50) and documentation kit

The Personal Visualizer (TPV) license is included with PXG+ and PXGTurbo+ Packaged Systems and Custom Systems ordered with factory-installed PXG+ and PXGTurbo+ graphics options. Field-installable PXG+ and PXGTurbo+ graphics options do not include The Personal Visualizer (TPV) license; order it separately. A Z-Buffer is recommended for all systems running TPV. Order media and documentation separately.

QL-GXZA8-AA	The Personal Visualizer (TPV) license
QA-GXZAA-H5	TPV media (TK50) and documentation kit
QA-GXZAA-GZ	TPV documentation only

Xmedia Runtime (multimedia software)

Xmedia Runtime license included with DECvideo/PIP and DECaudio options. Order media and documentation separately.

QP-LBDAA-01	Xmedia Tools Runtime license (audio/video)
QB-MB5AA-AA	Xmedia Tools Runtime license (audio/video) and software on TK50
QA-MB4AA-H5	Xmedia tools for RISC ULTRIX on TK50
QB-XUVAA-AA	Xmedia tools full developer's kit on CD-ROM
QB-XUWAA-AA	Xmedia tools full developer's kit (TK50 and CD-ROM)

The following server kit is required only if serving VAX systems.

QA-YL5AA-H5	ULTRIX workstation server media (TK50) and documentation kit
QA-YL5AA-H8	ULTRIX workstation server media (CD-ROM) and documentation kit
QA-YL5AA-HM	ULTRIX workstation server media (magtape) and documentation kit

DECnet ULTRIX license must be purchased separately. DECnet media included in ULTRIX V4.2a CD-ROM media kit, but must be ordered separately if ULTRIX V4.2a TK50 media kit is ordered.

QL-YT9AC-AA	DECnet-ULTRIX/RISC license
QA-YT9AA-H5	DECnet-ULTRIX/RISC media (TK50)
QA-YT9AA-GZ	DECnet-ULTRIX/RISC documentation

FORTRAN

QL-VV6AC-AA	FORTRAN for RISC ULTRIX license
QL-VV7AA-AA	FORTRAN for RISC ULTRIX educational license
QA-VV6AA-H5	FORTRAN for RISC ULTRIX media (TK50)
QA-VV6AA-H8	FORTRAN for RISC ULTRIX media (CD-ROM)

Encryption

QL-VV3A8-BA	ULTRIX (RISC) encryption license
QA-VV3AA-H5	ULTRIX encryption media (TK50) and documentation
QA-VV3AA-H8	ULTRIX encryption media (CD-ROM) and documentation

Step 12—Software *(Continued)*

DEC SoftPC allows RISC ULTRIX systems to run MS-DOS programs with no added hardware. DEC SoftPC V2.2 runs on both workstations and timesharing systems under ULTRIX.

QL-YP7AC-3B	DEC SoftPC for RISC ULTRIX single-user license
QA-YP7AA-H5	DEC SoftPC for RISC ULTRIX media (TK50)
QA-YP7AA-HM	DEC SoftPC for RISC ULTRIX media (magtape)
QA-YP7AA-GZ	DEC SoftPC for RISC ULTRIX documentation

Multiuser Upgrade Licenses

A 2-user license included with all systems. To increase the maximum number of users, select the appropriate licenses upgrades below.

QL-VV1A8-B5	3- to 8-user upgrade license
QL-VV1A8-B6	9- to 16-user upgrade license
QL-VV1A8-BS	17- to 32-user upgrade license
QL-VV1A8-BT	33- to 64-user upgrade license
QL-VV1A8-B9	65- to unlimited-user upgrade license

DECstation 5000 Series Upgrades

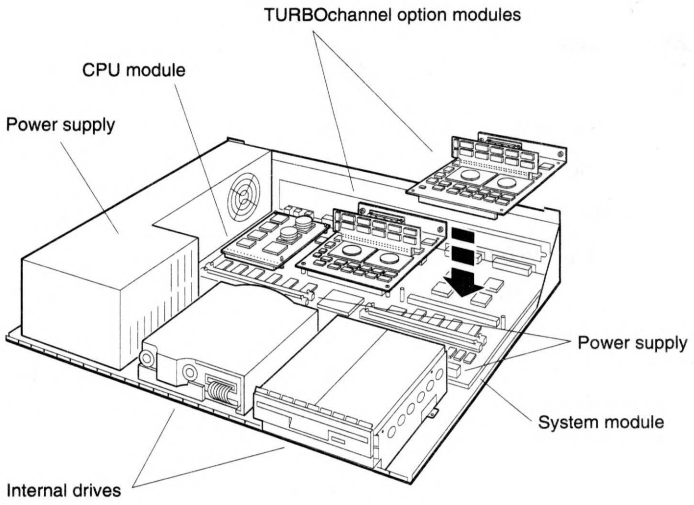
Upgrade kits are installed by Digital Services.

	From	To	Note
PM321-DY/DZ	DECstation 2100	DECstation 5000 Model 120	1
PM321-LY/LZ	DECstation 2100	DECstation 5000 Model 125	1
PM327-YY/YZ	DECstation 2100	DECstation 5000 Model 133	1
PM321-MY/MZ	DECstation 3100	DECstation 5000 Model 125	1
PM327-ZY/ZZ	DECstation 3100	DECstation 5000 Model 133	1
PM38U-AY	DECstation 5000 Model 200	DECstation 5000 Model 240	2
R3000 CPU Upgrades			
KN02-CC	DECstation 5000 Models 20/120 with R3000 20-MHz daughter card	DECstation 5000 Models 25/125 with R3000 25-MHz daughter card	3
KN02-DC	DECstation 5000 Models 25/125 with R3000 25-MHz daughter card	DECstation 5000 Models 33/133 with R3000 33-MHz daughter card	3

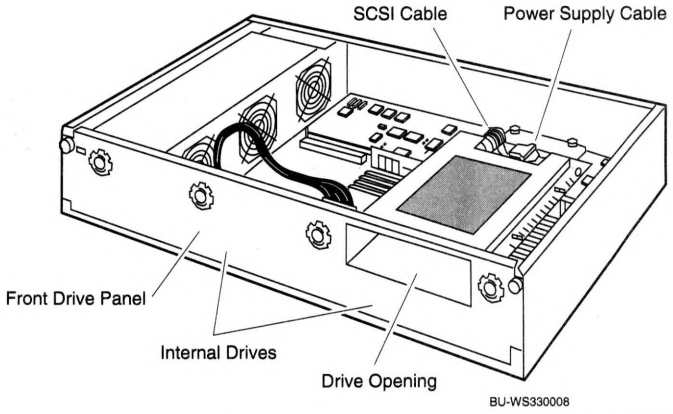
Notes

1. Upgrade kits include: DECstation 5000 Model 100 series enclosure, power supply, base system module, 20-MHz, 25-MHz, or 33 MHz CPU daughter card, HX graphics, keyboard/mouse cable, color and grayscale monitor cables, brackets for two RZ2x disk drives and one RX23 diskette drive, Thick wire-to-ThinWire Ethernet adapter DESTA-BA with thick wire cable for attaching DESTA to base system, and required upgrade licenses (ULTRIX Workstation Software license and DECnet-ULTRIX license).
2. Upgrade kits include: DECstation 5000 Model 240 enclosure, base system module, 40-MHz CPU daughter card, and required upgrade license. Requires mandatory return of Model 200 parts.
3. CPU daughter card upgrades include required upgrade licenses (ULTRIX Workstation Software license). Requires mandatory return of CPU daughter card.

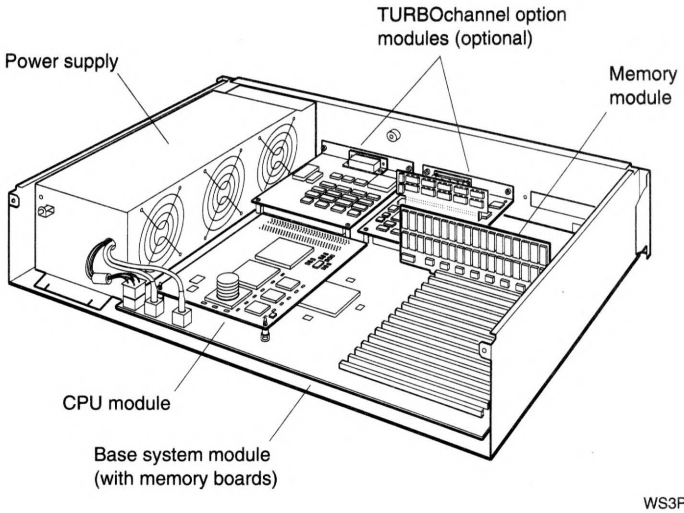
Personal DECstation 5000 Models 20, 25, 33



DECstation 5000 Models 120/125



DECstation 5000 Model 240



DECstation 5000 Specifications

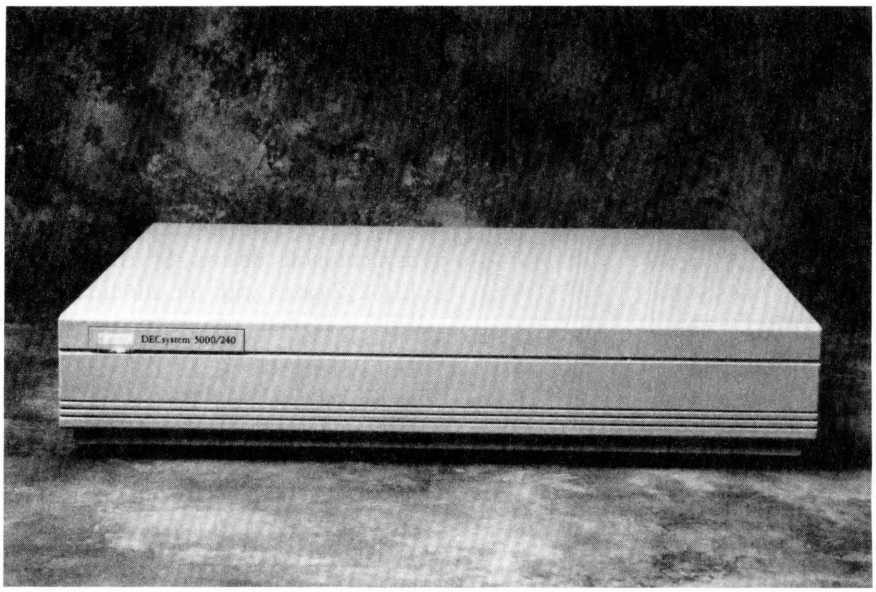
Power requirements	Model 25	Model 133	Model 240
Line voltage	120/240 V	120/240 V	120/240 V
Voltage tolerance—RMS	88–132 V/194–264 V	88–132 V/194–264 V	88–132 V/194–264 V
Frequency—single phase	50/60 Hz	50/60 Hz	50/60 Hz
Frequency variations	47–63 Hz	47–63 Hz	47–63 Hz
Maximum running current	5.1 A/2.6 A		9.5 A/5.3 A
Maximum power consumption	343 W	302 W	359 W
Operating environment			
Temperature	10°–40° C (50°–104° F)	10°–40° C (50°–104° F)	10°–40° C (50°–104° F)
Humidity	20%–80% noncondensing	10%–90% noncondensing	10%–90% noncondensing
Maximum operating altitude	2.44 km (8,000 ft)	2.44 km (8,000 ft)	2.44 km (8,000 ft)
Physical characteristics			
Height	9.1 cm (3.6 in.)	10.2 cm (4.0 in.)	9.2 cm (3.6 in.)
Width	40.6 cm (16 in.)	51.0 cm (20.1 in.)	51.0 cm (20.1 in.)
Depth	43.2 cm (17 in.)	43.5 cm (17.1 in.)	43.5 cm (17.1 in.)
Weight	5.8 kg (15.0 lb)	12.7 kg (28.0 lb)	12.7 kg (28.0 lb)

Workstation Color Monitors

Product Northern Hemisphere Southern Hemisphere	**VRT13** **-DA* -D3**** –	**VRC16** **-CA** **-C4**	**VRT16** **-DA** **-D4**	**VRT16** **-HA** **-H4**	**VR320** **-CA** **-C4**	**VR320** **-DA** **-D4**	**VRT19** **-DA* -D3**** **-D4**	**VRT19** **-HA** **-H4**
CRT Screen size Dot pitch Phosphor Surface treatment	13 V/14-in. Trinitron 0.26 mm P22 Silica	16 V/17-in. FS 0.26 mm P22 Silica	16 V/17-in. Trinitron 0.26 mm P22 Silica	16 V/17-in. Trinitron 0.26 mm P22 Conductive Silica	19 V/20-in. 0.31 mm P22 AR Panel	19 V/20-in. 0.31 mm P22 AR Panel	19 V/20-in. Trinitron 0.31 mm P22 Silica	19 V/20-in. Trinitron 0.31 mm P22 Conductive AR
Resolution/Refresh Rate (Hz) (All modes are non-interlaced except for ***8514/A which is interlaced.)	– – 1024 × 768 (87)*** – – 1024 × 768 (60) – 800 × 600 (56) – 640 × 480 (70) 640 × 480 (60)	– 1280 × 1024 (66) 1024 × 768 (87)*** 1024 × 768 (72) 1024 × 768 (70) 1024 × 768 (60) 800 × 600 (72) 800 × 600 (56) 640 × 480 (72) 640 × 480 (70) 640 × 480 (60)	– 1280 × 1024 (66) – – – – – – – – – –	1280 × 1024 (72) 1280 × 1024 (66) – – – – – – – – – –	– 1280 × 1024 (66) – – – – – – – – – –	1280 × 1024 (72) – – – – – – – – – – –	– 1280 × 1024 (66) – – – – – – – – – –	1280 × 1024 (72) 1280 × 1024 (66) – – – – – – – – – –
Active display Horizontal (maximum) Vertical (maximum)	240 mm (9.4 in.) 180 mm (7.0 in.)	300 mm (11.8 in.) 236 mm (9.3 in.)	295 mm (11.6 in.) 236 mm (9.3 in.)	295 mm (11.6 in.) 236 mm (9.3 in.)	342 mm (13.5 in.) 273 mm (10.7 in.)	342 mm (13.5 in.) 273 mm (10.7 in.)	343 mm (13.5 in.) 274 mm (10.7 in.)	343 mm (13.5 in.) 274 mm (10.7 in.)
Connectors Signal Power	9 pin D-subminiature IEC receptacle	BNC (5) IEC receptacle	BNC (3) IEC receptacle	BNC (3) IEC receptacle	BNC (3) IEC receptacle	BNC (3) IEC receptacle	BNC (3) IEC receptacle	BNC (3) IEC receptacle
Signal cable	Included with monitor 9 to 15-pin D-subminiature	Included with system	Included with system	Included with system	Included with system	Included with system	Included with system	Included with system
Power supply AC Auto ranging Consumption	100–120 V/50–60 Hz* 220–240 V/50 Hz** No 80 W maximum	90–264 V/50–60 Hz Yes 110 W maximum	90–264 V/50–60 Hz Yes 200 W maximum	90–264 V/50–60 Hz Yes 200 W maximum	90–264 V/50–60 Hz Yes	90–264 V/50–60 Hz Yes	90–264 V/50–60 Hz *America/**Europe Yes 220 W maximum	90–264 V/50–60 Hz Yes 220 W maximum
Dimensions Height Width Depth	355 mm (14.0 in.) 348 mm (13.7 in.) 411 mm (16.2 in.)	432 mm (17.0 in.) 411 mm (16.2 in.) 434 mm (17.1 in.)	409 mm (16.1 in.) 406 mm (16.0 in.) 453 mm (17.8 in.)	409 mm (16.1 in.) 406 mm (16.0 in.) 453 mm (17.8 in.)	457 mm (18.1 in.) 495 mm (19.5 in.) 452 mm (17.8 in.)	457 mm (18.1 in.) 495 mm (19.5 in.) 452 mm (17.8 in.)	474 mm (18.7 in.) 480 mm (18.9 in.) 505 mm (19.9 in.)	474 mm (18.7 in.) 480 mm (18.9 in.) 505 mm (19.9 in.)
Weight	13.0 kg (29 lb)	25 kg (55 lb)	25.3 kg (56 lb)	25.3 kg (56 lb)	29 kg (64 lb)	25.3 kg (56 lb)	32.5 kg (71.5 lb)	32.5 kg (71.5 lb)
MPRII low-emission monitor	–	–	–	Yes	–	–	Yes	Yes
FCC/VDE/VCCI Class A Class B	Yes –	Yes –	Yes –	Yes –	Yes –	Yes –	Yes –	Yes –
UL/CSA/TUV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHHS/HWC/PTB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Workstation Grayscale Monitors

Product Northern Hemisphere Southern Hemisphere	**VRM17** **-AA** **-A4**	**VRM17** **-HA** **-H4**	**VR319** **-CA** **-C4**	**VR319** **-DA** **-D4**
CRT Screen size Dot pitch Phosphor Surface treatment	 17-in. FS N/A PC104 Silica	 17-in. FS N/A PC104 Conductive Silica	 19-in. N/A P192 Mechanical Etch	 19-in. N/A P192 Mechanical Etch
Resolution/Refresh Rate (Hz) (All modes are non-interlaced)	1280 × 1024 (72) – – 1024 × 768 (72)	1280 × 1024 (72) – – 1024 × 768 (72)	– 1280 × 1024 (66) – –	1280 × 1024 (72) – – –
Active display Horizontal (maximum) Vertical (maximum)	 295 mm (11.6 in.) 236 mm (9.3 in.)	 295 mm (11.6 in.) 236 mm (9.3 in.)	 342 mm (13.5 in.) 273 mm (10.7 in.)	 342 mm (13.5 in.) 273 mm (10.7 in.)
Connectors Signal Power	 BNC (1) IEC receptacle	 BNC (1) IEC receptacle	 BNC (1) IEC receptacle	 BNC (1) IEC receptacle
Signal cable	Included with system	Included with system	Included with system	Included with system
Power supply AC Auto ranging Consumption	 90–264 V/50–60 Hz Yes 75 W maximum	 90–264 V/50–60 Hz Yes 75 W maximum	 90–264 V/50–60 Hz Yes	 90–264 V/50–60 Hz Yes
Dimensions Height Width Depth	 419 mm (16.5 in.) 406 mm (16.0 in.) 375 mm (14.75 in.)	 419 mm (16.5 in.) 406 mm (16.0 in.) 375 mm (14.75 in.)	 457 mm (18.1 in.) 495 mm (19.5 in.) 401 mm (15.8 in.)	 457 mm (18.1 in.) 495 mm (19.5 in.) 401 mm (15.8 in.)
Weight	16.8 kg (37 lb)	16.8 kg (37 lb)	21.8 kg (48 lb)	21.8 kg (48 lb)
MPRII low-emission monitor	–	Yes	–	–
FCC/VDE/VCCI Class A Class B	 Yes –	 Yes –	 Yes –	 Yes –
UL/CSA/TUV	Yes	Yes	Yes	Yes
DHHS/HWC/PTB	Yes	Yes	Yes	Yes



Product Description

DECsystem 5000 Series (Multiuser/Server)

The DECsystem 5000 Series is Digital's RISC family of servers featuring the MIPS R3000-based chip set. These systems place the CPU on a removable daughter card that permits upgrading the processing power easily. This modular design offers long-term investment protection and an upgrade path to R4000-based CPU card at a future date. Systems include built-in thick wire Ethernet, and a synchronous SCSI controller on base system module. Over 2800 ULTRIX RISC applications are available now.

DECsystem 5000 Model 25 Entry-Level Server

The DECsystem 5000 Model 25 offers RISC performance in a low-cost server system. This entry-level server combines the power of a RISC system (19.2 SPECmarks) with the producitivity of a PC file server. System has one synchronous/asynchronous serial line with speeds up to 19.2 Kbits/second, and two TURBOchannel slots to allow use of specialized networking options.

The system has 8 Mbytes of memory embedded on system board and four memory expansion slots. Memory modules are available in 4- and 16-Mbyte packages for a system total of 16 and 40 Mbytes respectively. System cache is 128 Kbytes (64-Kbyte instruction, 64-Kbyte data). Internal storage is provided by two storage cavities; one slot is reserved for a SCSI hard drive and a second slot for an FDI diskette drive.

Model 25 is well suited as an entry level server for: PC server applications, database services, distributed retail outlets, small UNIX-based workgroups, and is an ideal application client for DECsystem 5900 dataserver.

Product Description *(Continued)*

DECsystem 5000 Model 133 Mid-Range Server

The Model 133 runs at 33 MHz (25.3 SPECmarks) and offers the expandable features frequently demanded in the today's markets. Memory can be expanded to 128 Mbytes and internal storage is provided by three storage cavities. Slot 1 is reserved for a removable media device, and slots 2 and 3 support hard disk drives. The 600-Mbyte compact disc reader enables access to online ULTRIX documentation, CD-based binary distribution, and applications from CD-ROM.

Two EIA-232 serial ports provide a direct connection to the CPU enclosure for asynchronous devices. Synchronous connections can be made through the EIA-232 ports with the addition of the DEC WAN driver for ULTRIX and the DEC X.25 native mode for ULTRIX software.

DECsystem 500 Model 133 servers are ACE compatible; applications developed today will run on ARC-compliant machines in the future.

DECsystem 5000 Model 240 High-Performance Server

The DECsystem 5000 Model 240 is a high-performance (32.4 SPECmark), multi-user RISC server designed to extend the performance envelope of the DECsystem family. It provides superb across-the-spectrum performance in all areas of work-station computation (I/O, integer and floating point, and network throughput) in a compact, low-cost desktop package. It maintains full and complete binary compatibility with all other Digital RISC systems.

NFS performance is increased by up to 300 percent with the addition of a Prestoserve option, and DMA I/O controllers substantially improve on-board SCSI and Ethernet performance. As part of the DECsystem family, the Model 240 is able to take advantage of third-party TURBOchannel device portfolio IPI disk controllers, large frame buffers and array processors.

Step 1—Systems

Select system. 120-V systems include required power cord. Select the appropriate power cord for all 240-V systems from Step 2.

Any field-installable option ordered with a system ships separately for customer installation.

DECsystem 5000 Servers include

- Base module with CPU daughter card
- TURBOchannel I/O interconnect: Model 25 two slots; Models 133/240 three slots
- Memory
- Thick wire Ethernet controller on base system module
- Synchronous SCSI controller on base system module
- EIA-232 serial communication (synchronous/asynchronous) ports—Model 25 one line; Models 133/240 two lines
- 1.8-meter (6-foot) SCSI cable (50-pin small connector to 50-pin large connector)
- 0.6-meter (2-foot) SCSI cable (50-pin small connector to 50-pin small connector)—Models 133/240 only
- 1.8-meter (6-foot) power cord (wall socket to system box, 120-V systems only)
- ULTRIX base license
- ULTRIX 4-user license
- ULTRIX server license
- English-language user documentation

Order Number 120 V/240 V	CPU	Memory	TURBO-Channel	EIA-232	Internal Storage Bays/Disks
Model 25					
PM319-MX*	25 MHz	8 MB (1-Mbit DRAM) parity	2 slots	One	Two
PM319-RX*	25 MHz	24 MB (4-Mbit DRAM) parity	2 slots	One	Two RZ25=426 MB†
Model 133					
PM338-2Y/2Z	33 MHz	8 MB (1-Mbit DRAM) parity	3 slots	Two	Three
PM338-3Y/3Z	33 MHz	16 MB (4-Mbit DRAM) parity	3 slots	Two	Three
PM338-4Y/4Z	33 MHz	16 MB (4-Mbit DRAM) parity	3 slots	Two	Three RZ25=426 MB†
Model 240					
PM399-AY/AZ	40 MHz	16 MB (1-Mbit DRAM) ECC	3 slots	Two	None
PM399-CY/CZ	40 MHz	32 MB (4-Mbit DRAM) ECC	3 slots	Two	None

* PM319-MX/RX include 120-V power cord. International kits ship with 240-V systems.
† RZ25 disk includes ULTRIX factory-installed software.

Step 2—Power Cords (not required for 120-V systems)

Select power cord for all 240-V systems. Power cords connect system to wall socket.

Power Cord	Country
Included	U.S.
BN19W-2E	Austria
BN19K-2E	Belgium
BN19K-2E	Denmark
BN19W-2E	Finland
BN19W-2E	France
BN19W-2E	German
BN19W-2E	Holland
BN19U-2E	Israel
BN19Z-2E	Italy
BN19W-2E	Norway
BN19W-2E	Portugal
BN19W-2E	Spain
BN19W-2E	Sweden
BN19E-2E	Switzerland
BN19A-2E	U.K./Ireland
BN19H-2E	Australia/New Zealand
BN19P-1K	U.S./Canada

Step 3—Memory

Model 25: Includes 8 Mbyes on system board. Four memory slots total.

MS01-AA	4-Mbyte parity (2 × 2-Mbyte 1-Mbit DRAM), maximum 16 Mbytes
MS01-CA	16-Mbyte parity (2 × 8-Mbyte 4-Mbit DRAM), maximum 40 Mbytes

Model 133: Eight memory slots total

MS01-AA	4-Mbyte parity (2 × 2-Mbyte 1-Mbit DRAM), maximum 32 Mbytes
MS01-CA	16-Mbyte parity (2 × 8-Mbyte 4-Mbit DRAM), maximum 128 Mbytes

Model 240: Fifteen memory slots total (14 if Prestoserve is installed)

MS02-AA	8-Mbyte ECC (1 × 8-Mbyte 1-Mbit DRAM), maximum 120
MS02-CA	32-Mbyte ECC (1 × 32-Mbyte 4-Mbit DRAM), maximum 480

Note: -AA modules cannot be mixed with -CA modules.

Prestoserve Option: Must be placed in 15th memory slot (slot number 14); available for Model 240 servers only

Installation of Prestoserve reduces maximum memory to 112 Mbytes using 1-Mbit DRAMs and 448 Mbytes using 4-Mbit DRAMS.

DJ-523PS-AA	Includes 1-Mbyte cache RAM module and software license.

Step 4—Storage

Select storage devices if required.

Model 25: Supports one 3.5-inch diskette drive and one 3.5-inch fixed disk drive in system enclosure.

Model 133: Supports one removable media device (RX23, RRD42, TLZ06, TZK10) and two fixed disk drives in system enclosure.

Model 240: Does not support internal storage.

- A single RZ24L or RZ23L disk drive is recommended as data/swap device only.
- Recommended configurations for standalone systems are:
  Model 25: one RZ25; Model 133: one RZ25, or two RZ24Ls or one RZ24L and one RZ23L
- Maximum seven SCSI devices are supported on the base SCSI controller Select SCSI TURBOchannel option (PMAZ-AA) if more are required.

Step 4a—Internal Drives

Model 25: Select maximum of one internal diskette and one hard disk drive. Factory-installed RZ25-FM disk includes Factory-Installed Software (FIS).

RX26-FP/FN	2.88-Mbyte 3.5-inch internal diskette drive
RZ23L-FM/FN	121-Mbyte 3.5-inch internal disk drive
RZ24L-FM/FN	245-Mbyte 3.5-inch internal disk drive
RZ25-FM/FN	426-Mbyte 3.5-inch internal disk drive

To embed a DECsystem 2100 or 3100 3.5-inch SCSI disk drive in a Model 25, order hard drive mounting bracket.

RZ2X-FN	Hardware mounting drive bracket and documentation for Model 25

Model 133: Select maximum of one removable media device and two hard disk drives. Factory-installed RZ25-FM disk includes Factory-Installed Software.

RX23-FM/FL	1.4-Mbyte 3.5-inch internal diskette drive
RRD42-FM/FL	600-Mbyte 3.5-inch internal compact disc drive
TLZ06-FM/FL	4.0-Gbyte 3.5-inch internal 4-mm digital audio tape (DAT)
TZK10-FM/FL	525-Mbyte 3.5-inch internal QIC tape drive
RZ23L-FM/FL	121-Mbyte 3.5-inch internal disk drive
RZ24L-FM/FL	245-Mbyte 3.5-inch internal disk drive
RZ25-FM/FL	426-Mbyte 3.5-inch internal disk drive

Step 4b—External Drives

Each SZ12, TLZ06, TKZ08, and RRD42 expansion device includes a SCSI cable (BC19J-IE). External expansion boxes for 240-V systems require a country-specific power cord.

Base SCSI controller supports seven SCSI devices; maximum of three expansion boxes with one internal device. Select SCSI TURBOchannel option if more are required.

PMAZ-AA/AB	SCSI TURBOchannel option card

Single Drive Expansion Boxes

TLZ06-FA	4.0-Gbyte 4-mm digital audio tape (DAT)
TKZ08-AA	2.2-Gbyte 8-mm tape
RRD42-FA	600-Mbyte compact disc drive
TSZ07-CA*	40-Mbyte/140-Mbyte SCSI 9-track tape at 1600/6250 bits/inch. Must order U.S./Canada country kit (TSZK7-AA).

* TSZ07 is supported on Model 240 only

Expansion Boxes (SZ03, SZ12, and SZ16)

For SZ03, SZ12, and SZ16 expansion box information, see Chapter 7, *Storage Devices*.

Step 4c—TcE Expansion Box

Note: Model 25 requires 61-cm (2-foot) SCSI cable (small connector to small connector, **17-TCESC-01**) to connect TcE to system box. Cable is not required if TcE is daisychained to another expansion box. Models 133 and 240 include 61-cm (2-foot) SCSI cable.

TURBOchannel Extender (TcE) box supports TURBOchannel extender and three half-height devices: one half-height removable device and two half-height hard drives. TcE includes base connector card and cable, SCSI cable, and 120-V power cord.

- Select TcE expansion box when dual- or triple-width TURBOchannel cards are required.
- System supports maximum of three TcE boxes, one per TURBOchannel slot.
- TcE can be daisychained with other external storage devices but must be last device in chain.
- 240-V devices require a country-specific power cord.

PMTCE-AA	TcE, no options, no disks
PMTCE-DA	TcE, PXG+ 8 planes, no disks
PMTCE-EA	TcE, PXG+ 24 planes, no disks
PMTCE-FA	TcE, PXGTurbo+, no disks
PMTCE-LA	TcE, PXG+ Two RZ25s (852-Mbyte), one CD-ROM
PMTCE-MA	TcE, PXGTurbo+ Two RZ25s (852-Mbyte), one CD-ROM

Additional SCSI devices may be purchased separately and are customer installable. The following SCSI devices are supported in TcE expansion box.

RZ23L-FL	121-Mbyte internal disk drive
RZ24L-FL	245-Mbyte internal disk drive
RZ25-FL	426-Mbyte internal disk drive
TZK10-FL	525-Mbyte internal quarter inch cartridge (QIC) tape drive
RX23-FL	1.4-Mbyte internal diskette drive
RRD42-FL	CD-ROM internal compact disc drive

Note: TcE allows for full use of all three TURBOchannel slots while incorporating dual- or triple-width cards. It does not permit the connection of more than three TURBOchannel option cards.

Step 4d—Workstand

H9855-AA	Horizontal workstand. Holds one DECsystem 5000 system box and three SZ12 expansion boxes. Four mounting wheels included.

Step 5—Networking Adapters and Miscellaneous Cables

Base system module includes thick wire Ethernet connector. Two adapters are available, ThinWire or 10BaseT (Twisted Pair):

H3350-AA	10BaseT (Twisted Pair) Ethernet adapter
DESTA-BA	ThinWire Ethernet station adapter

Select desired length of thick wire to connect ThinWire or 10BaseT adapter to base system. Do not attach adapter directly to base system module.

BNE4C-xx	Thick wire 802.3/Ethernet cable (-xx = -02/-05 refers to length in meters)
BNE3H-xx	Thick wire transceiver cable with straight connector—PVC (-xx = -05/-10/-20/-40 refers to length in meters)
BNE3L-xx	Thick wire transceiver cable with straight connector—Teflon (-xx = -05/-10/-20/-40 refers to length in meters)

Right-angle Ethernet cables are not supported.

BC16M-xx	ThinWire Ethernet cable (-xx = -06/-15/-30 refers to length in feet)

See Chapter 6, *Networks, Communications, and Cables,* for more information.

BC19J-1E	18-inch (45.7-cm) SCSI cable, large connector to large connector, (included with each expansion device)
BC19J-03	3-foot (0.9-m) SCSI cable, large connector to large connector
BC19J-06	6-foot (1.8-m) SCSI cable, large connector to large connector
BC09D-03	3-foot (0.9-m) SCSI cable, small connector to large connector (system box to expansion box)
BC09D-06	6-foot (1.8-m) SCSI cable, small connector to large connector (included with each system)

Step 6—TURBOchannel Communications Options (Factory/Field Installed)

Each option requires one TURBOchannel slot

PMAD-AA/AB	Thick wire Ethernet TURBOchannel option card
DEFZA-AA	DEC FDDIcontroller 700 (fiber optic)
DEFZA-CA	DEC FDDIcontroller 700C (copper)

Step 7—Console Terminal

A console device is necessary for a system to function; select video terminal (e.g., VT420) unless otherwise available. **Note:** Models 25 and 133 include a console cable. Model 240 does NOT; order console cable separately.

Step 8—Printers

Select serial printers as required. Serial printers can be connected to an asynchronous line. A cable (e.g. BC16E-xx) must be ordered unless otherwise available. See Chapter 8, *Terminals and Printers.*

Step 9—Software

DECsystem 5000 Multiuser/Servers require ULTRIX V4.2a or higher.

Software Processor Code	Model 25 = **N** Model 133 = **N** Model 240 = **S**

An ULTRIX media and documentation kit is recommended for the first system on site. ULTRIX kits include documentation, and DECwindows software on tape or compact disc.

QA-VYVAA-H5	ULTRIX media (TK50) and documentation kit
QA-VYVAA-H8	ULTRIX media (CD-ROM) and documentation kit

DEC C license is included with ULTRIX V4.2a or higher; order media and documentation separately.

QA-YSJAA-H5	DEC C for RISC ULTRIX media (TK50)
QA-YSJAA-GZ	DEC C RISC ULTRIX documentation

DECnet ULTRIX license must be purchased separately. DECnet media included in ULTRIX V4.2a or higher CD-ROM media kit, but must be ordered separately if ULTRIX V4.2a or higher TK50 media kit is ordered.

QL-YT9A*-AA	DECnet-ULTRIX/RISC license
QA-YT9AA-H5	DECnet-ULTRIX/RISC media (TK50)
QA-YT9AA-GZ	DECnet-ULTRIX/RISC documentation

FORTRAN

QL-VV6A*-AA	FORTRAN for RISC ULTRIX license
QL-VV7AA-AA	FORTRAN for RISC ULTRIX educational license
QA-VV6AA-H5	FORTRAN for RISC ULTRIX media (TK50)
QA-VV6AA-H8	FORTRAN for RISC ULTRIX media (CD-ROM)

Encryption

QL-VV3A8-BA	RISC ULTRIX encryption license
QA-VV3AA-H5	ULTRIX encryption media (TK50) and documentation
QA-VV3AA-H8	ULTRIX encryption media (CD-ROM) and documentation

DEC SoftPC allows RISC ULTRIX systems to run MS-DOS programs with no added hardware. DEC SoftPC runs on both workstations and timesharing systems under ULTRIX.

QL-YP7AC-3B	DEC SoftPC for RISC ULTRIX single-user license
QA-YP7AA-H5	DEC SoftPC for RISC ULTRIX media (TK50)
QA-YP7AA-HM	DEC SoftPC for RISC ULTRIX media (magtape)
QA-YP7AA-GZ	DEC SoftPC for RISC ULTRIX documentation

Step 9—Software *(Continued)*

Multiuser Upgrade Licenses

A 4-user license is included with all systems.

To increase the maximum number of users, select the appropriate license upgrades below.

QL-VYVA8-B8	5- to 8-user upgrade license
QL-VYVA8-B6	9- to 16-user upgrade license
QL-VYVA8-BS	17- to 32-user upgrade license
QL-VYVA8-BT	33- to 64-user upgrade license
QL-VYVA8-B9	65- to unlimited-user upgrade license

DECsystem 5000 Series Upgrades

Upgrade kits must be installed by Digital Services.

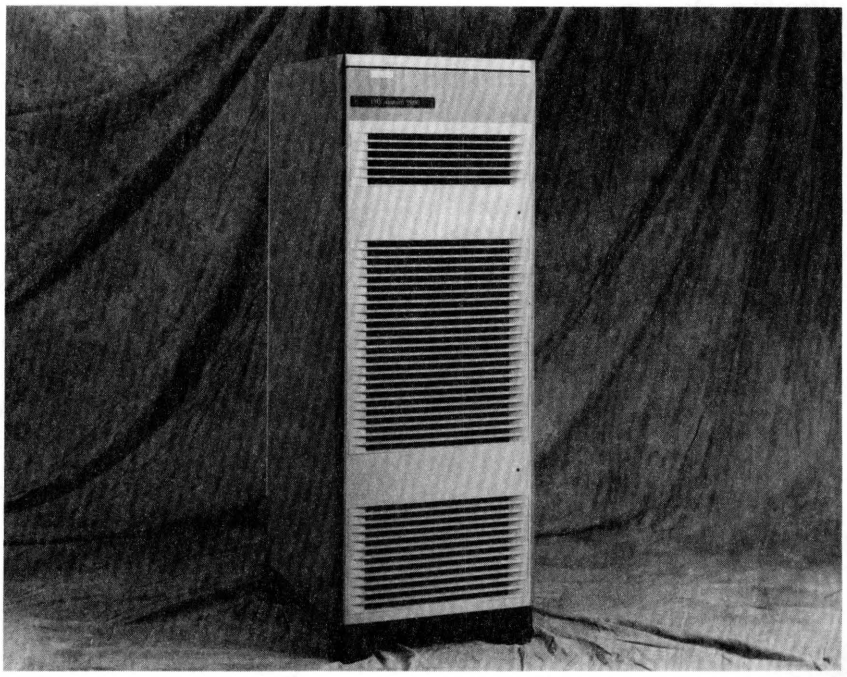
	From	To	Notes
PM38U-BY	DECsystem 5000 Model 200	DECsystem 5000 Model 240	1

Note

1. Upgrade kits include: DECsystem 5000 Model 240 enclosure, base system module, 40-MHz CPU daughter card, and required upgrade license. Requires mandatory return of DECsystem 5000 Model 200 parts.

See DECstation 5000 specifications on page 2.34 for power requirements, operating environment and physical characteristics information.

DECsystem 5900 Systems



Product Description

The DECsystem 5900 system is a server system that provides high-end functionality in the RISC product set. The DECsystem 5900 incorporates the CPU (R3000A) and storage in a 67-inch cabinet using a standard 19-inch drawer packaging scheme. The R3000A runs at 40 MHz, producing more than 32 SPECmarks; the system has a maximum memory capacity of 448 Mbytes.

The CPU drawer includes the 40-MHz R3000A-based CPU, Prestoserve, and the TURBOchannel extender. Prestoserve is a high-performance file system accelerator from Legato Systems, Inc. It significantly improves NFS (Network File System) performance. The TURBOchannel Extender is a board extension to the TURBOchannel bus which allows double- or triple-width cards to be used without precluding the use of all three TURBOchannel slots.

Each storage drawer incorporates up to seven 5.25-inch SCSI peripheral devices. Four peripheral drawers are supported in the DECsystem 5900 for a total of up to 28 devices, all in a relatively small footprint. The storage drawers support two SCSI buses each. The large modular drawers allow significant internal expansion capability and include internal TURBOchannel option slots.

The DECsystem 5900 is a non-desktop ULTRIX-based server that incorporates the TURBOchannel I/O interconnect. With TURBOchannel, unique Digital and third-party options can be integrated easily. TURBOchannel allows configuration expansion of up to four SCSI controllers. Third-party TURBOchannel options such as IPI storage controllers and Token Ring adapters allow the DECsystem 5900 to meet a variety of needs. Two TURBOchannel FDDI adapters are available from Digital to meet the demand of high-performance networking requirements.

Standard with the DECsystem 5900 is an integral Ethernet adapter that provides a peak throughput of 1.2 Mbytes/second. This adapter supports thick wire connections. For additional Ethernet throughput, an Ethernet adapter can be added via the TURBOchannel. The system includes TCP/IP software and NFSTM support (DECnet-ULTRIX license is optional).

Product Description
(Continued)

Two Digital FDDI controllers can be added via the TURBOchannel, providing access to a 100-Mbit/second FDDI network. The first option is a true fiber-optic controller (DEFZA-AA) which supports a maximum distance up to 1000 meters (3280 feet). The second option (DEFZA-CA) utilizes standard ThinWire co-axial cable with the full FDDI performance and a maximum distance of up to 100 meters (328 feet).

Dual DECsystem 5900 systems offer the same features as a single DECsystem 5900 system but with two systems sharing the same cabinet. Each system incorporates a CPU (R3000A) and storage in a 67-inch-high cabinet using a standard 19-inch drawer packaging scheme. Each system includes internal TURBOchannel option slots and the ability to configure up to 13 internal 5.25-inch full-height devices (a CD-ROM is included with each system), all in a relatively small footprint. In the storage drawer, devices can be divided evenly (14 devices per system) or unevenly (up to 26 devices on one system and two on the other).

Operating system support begins with ULTRIX V4.2a. All configurations are packaged with an ULTRIX 4-user license. Also included with each system is an ULTRIX Workstation Software Server license, which allows the DECsystem 5900 system to act as an application server in an X-Windows environment and as a boot server for ULTRIX-based workstations.

The DECsystem 5800 to DECsystem 5900 upgrade provides performance improvement to the DECsystem 5900 from the DECsystem 5800 (up to 300 percent increase based on SPECmarks). Application performance improvements can be increased with the addition of Prestoserve. The upgrade consists of a single order number which requires the mandatory return of the DECsystem 5800 kernel. Other components may also be returned for credit.

DECsystem 5900 Systems

Step 1—Systems

Select system.

DECsystem 5900 Systems include

- 67-inch cabinet with 19-inch rack mountable drawers
- TURBOchannel extender
- Three TURBOchannel slots
- 64 Mbytes of memory expandable to 448 Mbytes
- CPU-I/O module set with embedded 802.3/Ethernet (thick wire) controller and SCSI adapter
- RZ58 1.38-Gbyte SCSI drive
- RRD42 600-Mbyte CD-ROM drive
- 120-V power cord
- ULTRIX 2-user base license
- ULTRIX 2- to 4-user upgrade license
- ULTRIX/RISC Workstation Server license
- Prestoserve license (QL-YV5AS-AA) and functionality
- English-language hardware documentation
- One full-year product warranty

DU-59BT1-AA/A3 DECsystem 5900 120 V/240 V

Dual DECsystem 5900 Systems include

- 67-inch cabinet with 19-inch rack-mountable drawers
- Two CPU drawers, each includes:
  - Embedded 802.3/Ethernet (thick wire)
  - Embedded SCSI adapter
  - 64 Mbytes of memory
  - Three TURBOchannel slots plus TURBOchannel extender
- Two storage drawers, each includes:
  - RZ58 1.38-Gbyte SCSI drive
  - RRD42 600-Mbyte CD-ROM drive
- 120-V power cord
- Two Prestoserve licenses (QL-YV5AS-AA) and functionality
- Two ULTRIX 2-user base licenses
- Two ULTRIX 2- to 4-user upgrade licenses
- Two ULTRIX/RISC Workstation Server licenses
- English-language documentation
- One full-year product warranty

DU-59BT2-AA/A3 Dual DECsystem 5900 120 V/240 V

Step 2—Storage Expansion

Select additional storage drawers and storage devices as required. Refer to Chapter 7, *Storage Devices*, for further details on devices listed.

Step 2a—Internal Storage

Configuration Rules

- Maximum four storage drawers per system
- Each storage drawer accommodates up to seven devices in one of the following combinations:
  - Two full-height removable devices and five full-height disks (RX5x) or
  - One full-height and two half-height removable devices and four full height disks or
  - Seven full height disks.
- Each additional storage drawer requires a TURBOchannel-SCSI adapter (PMAZ-Bx—one SCSI adapter embedded on CPU)
- Up to six StorageServer 100s are supported; one in system enclosure and up to five standalones. Each StorageServer 100 requires three SCSI bus connections.

SZ29X-XA/XB	Storage drawer, requires PMAZ-BA adapter; factory/field installed
PMAZ-BA/BB	TURBOchannel-SCSI adapter; factory/field installed
RZ58-LF/LG	1.38-Gbyte, full-height SCSI disk; factory/field installed
TLZ06-LF/LG	4.0-Gbyte, full-height DAT drive; factory/field installed
TZ30-EM/EN	95-Mbyte, half-height tape drive; factory/field installed
TZK10-LF/LG	QIC, half-height tape drive factory/field installed
TZK09-AF	8-mm tape drive; field installed only
RX26-LF/LG	2.8-Mbyte, 3.5-inch, half-height floppy drive; factory/field installed
RRD42-EG/EH	600-Mbyte, half-height CD-ROM drive; factory/field installed
RW100-DA/DB	StorageServer 100 19.0-Gbyte optical library, internal to system enclosure; factory/field installed.

Step 2b—External Storage

Configuration Rules

- Each external SCSI device requires a dedicated TURBOchannel-SCSI adapter (PMAZ-BA) and an external SCSI cable (BC09D-12), i.e., two external SCSI devices require two PMAZ-BA adapters and two BC09D-12 cables
- Maximum one external enclosure per SCSI adapter

Step 2b—External Storage *(Continued)*

BC09D-12	12-foot (3.6-meter) external SCSI cable; small connector to large connector.
TSZ07	140-Mbyte 9-track tabletop tape drive. Refer to Chapter 7, *Storage Devices,* for ordering information.
TZ85-TA	2.6-Gbyte cartridge tape subsystem in tabletop enclosure.
RW100-CA	StorageServer 100 19.0-Gbyte optical library in standalone cabinet. Refer to Chapter 7, *Storage Devices*, for more information and configuration requirements.

Step 3—Memory

Select a maximum of 12 additional memory options. System can be expanded to 448 Mbytes.

MS02-CA	32 Mbytes ECC memory; factory or field installed.

Step 4—Networks and Communications

Select devices as required. See Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for more information. **Note:** Ethernet transceiver cables with right angle connectors are not supported on DECsystem 5900 systems.

Local and Wide Area Communication Servers
Each communications server requires an 802.3/Ethernet connection. Depending on the server selected, either a ThinWire BNC connection (e.g., BC16M cable) or a thick wire 15-pin AUI transceiver cable (e.g., BNE3x) is required. Software media and documentation and cables are also required. See descriptions in Chapter 6, *Networks, Communications, and Cables*, for ordering information.

DECserver 90L+, 90TL, 700, 250, and MUXserver 300, 310, 320, 380 Terminal and Printer Servers
Select a terminal or printer server to provide users with multiple session access to systems on a LAN, to minimize cabling complexity and costs, and to conserve host resources such as backplane slots.

DEC WANrouter 250, 500; DEC Network Integration Server 500, 600; Proteon 4100$^+$, CNX 500, TransPATH 335, 350 Multiprotocol Routers
Select a router to cost-effectively link a LAN to a remote system or another LAN and to offload routing overhead from the application host system.

Host-Based Communications Controllers
Select host-based communications controllers for standalone systems (without LAN connectivity), or for other special requirements. Typically, local and wide area communications servers are preferred. Refer to Chapter 6, *Networks, Communications, and Cables*, and the *Networks Buyer's Guide* for more information.

Network Connectivity Products
See Chapter 6, *Networks, Communications, and Cables,* and the *Networks Buyer's Guide.*

LAN Communications Controllers

DEFZA-AA	DEC FDDIcontroller 700: fiber optic interface; factory installed/field installed.
DEFZA-CA	DEC FDDIcontroller 700: ThinWire interface; factory installed/field installed.

Step 5—Console Terminal

A console terminal is necessary for a system to function. Order a video terminal (e.g., VT420) unless otherwise available. See Chapter 8, *Terminals and Printers,* for ordering information.

Step 6—Terminals and Printers

Select terminals and printers as required. See Chapter 8, *Terminals and Printers,* for ordering information.

Step 7—TURBOchannel Options

Each option requires one TURBOchannel slot.
Note: Field-installed options require Digital Customer Services installation.

PMAD-AA/AB	Thick wire Ethernet TURBOchannel option, factory installed/field installed.
PMAZ-BA/BB	Additional SCSI TURBOchannel option, supports up to seven internal devices or one external SCSI device; factory installed/field installed.
CITCA-AA	TURBOchannel to CI adapter—triple wide, mounts in TURBOchannel extender.
DSYTI-AB	DEC WANcontroller 720: synchronous communications interface. Refer to Chapter 6, *Networks, Communications, and Cables,* for more information.

Step 8—Software

Upgrade license required to support additional users beyond those included in base systems. System support begins with ULTRIX V4.2a.

Processor Code DECsystem 5900 = **S**

Select the appropriate NAS for ULTRIX software level. See description of NAS packages on page 9.2. **Note:** The NAS packaged products do not include hardcopy documentation for the components (the documentation is CD-ROM only). To order NAS component hardcopy documentation, see page 9.5 for listing of order numbers.

QL-XVCAS-AA	NAS 200 (Network Application Support 200) for ULTRIX
QA-XVCAA-Hx	NAS 200 for ULTRIX media and documentation kit
QL-XVAAS-AA	NAS 300 (Network Application Support 300) for ULTRIX
QA-XVAAA-Hx	NAS 300 for ULTRIX Media and Documentation Kit
	Note: x denotes media type: 8 = CD-ROM, 5 = TK50, M = magtape

Multiuser License Upgrades

QL-VYVA8-B8	ULTRIX 5- to 8-user upgrade license
QL-VYVA8-B6	ULTRIX 9- to 16-user upgrade license
QL-VYVA8-BS	ULTRIX 17- to 32-user upgrade license
QL-VYVA8-BT	ULTRIX 33- to 64-user upgrade license
QL-VYVA8-B9	ULTRIX 65- to unlimited-user upgrade license

DECnet-ULTRIX

QL-YT9AS-AA	DECnet-ULTRIX software license

RISC FORTRAN

QL-VV6AS-AA	RISC FORTRAN software license

Media and Documentation

QA-VYVAA-Hx	ULTRIX media and documentation **Note:** CD-ROM media kit includes DECnet-ULTRIX media and documentation
QA-YT9AA-H5	DECnet-ULTRIX media and documentation **Note:** Available on TK50 media only
QA-VV6AA-Hx	ULTRIX FORTRAN-77 media and documentation
QA-YL5AA-Hx	ULTRIX Workstation server media and documentation **Note:** Only required if serving VAX/ULTRIX systems x denotes media type: 5 = TK50; 8 = CD-ROM

Step 9—Power Cords

BN18P-4E	Denmark, United Kingdom, Ireland, Switzerland
BN18C-4E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN18D-4E	Australia
BN18E-4E	Italy
BN18F-4E	Israel
BN18H-4E	India
BN18R-4E	U.S., Canada, Japan

Step 10—Environmental Products

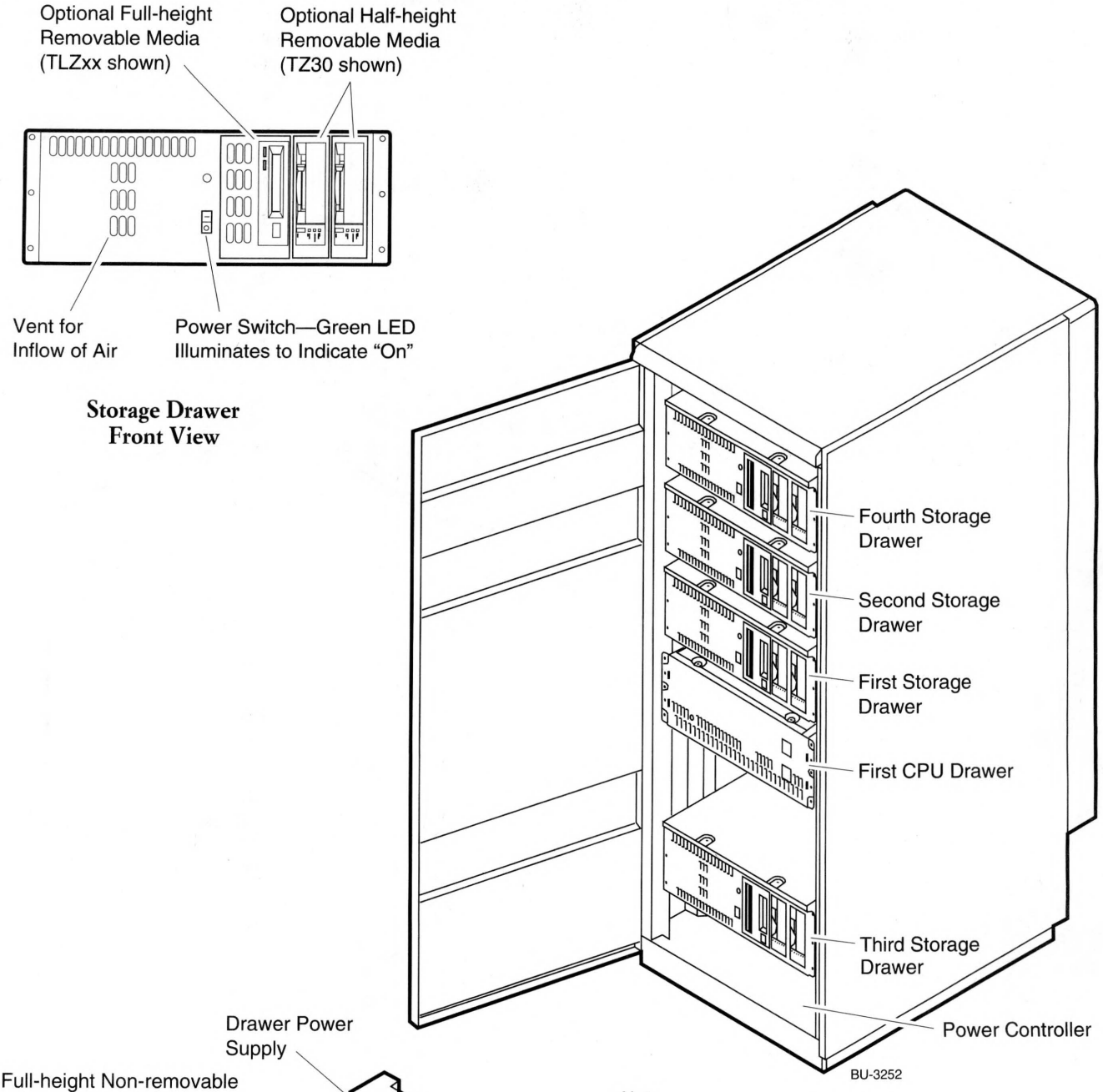
Select environmental power products if required. See Chapter 5, *VAXcluster Options/System Expansion, Digital's Environmental Power Products Catalog,* and *DECdirect* catalog for details.

DECsystem 5800 to DECsystem 5900 Upgrade

DU-59BU1-AA/A3	Upgrades a DECsystem 5800 to a DECsystem 5900. Includes 64 Mbytes of memory, RZ58 1.3-Mbyte SCSI drive, RRD42 600-Mbyte CD-ROM, Prestoserve license, TURBOchannel extender, storage drawer, documentation, and 120-V power cord. Requires mandatory return of DECsystem 5800 kernel.

DECsystem 5900 Specifications

Power Requirements	
Nominal voltage	120/230 V
Nominal frequency	50–60 Hz
Power consumption	1560 W
Physical Characteristics	
Height	170 cm (66.9 in.)
Width	61 cm (24 in.)
Depth	86.4 cm (34 in.)
Weight	440 kg (970 lbs)
Shipping Weight	485 kg (1070 lbs)
Operating Environment	
Temperature	0° to 32°C (32° to 90°F)
Relative humidity	20% to 80%
Maximum operating altitude	3000 meters (10,000 feet)

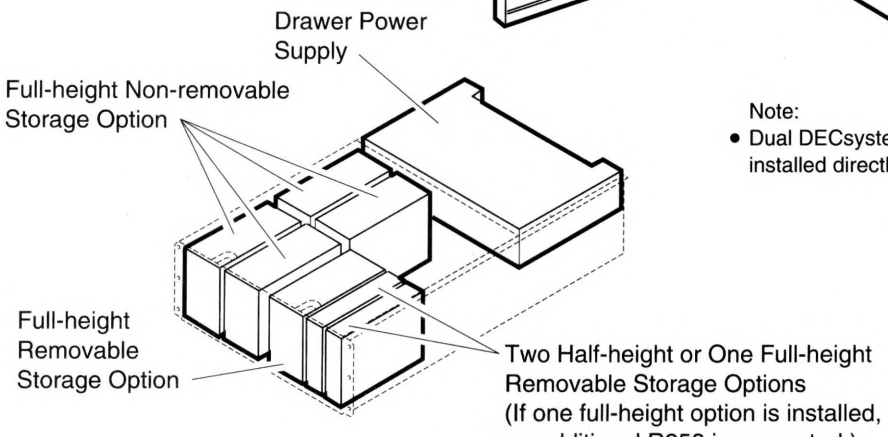


Storage Drawer Front View

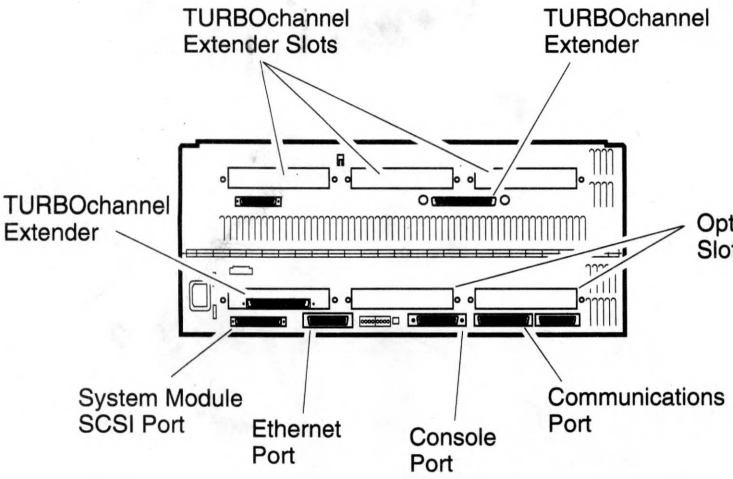
Note:

- Dual DECsystem 5900 systems' second CPU drawer is installed directly under first CPU drawer.

DECsystem 5900 Front View



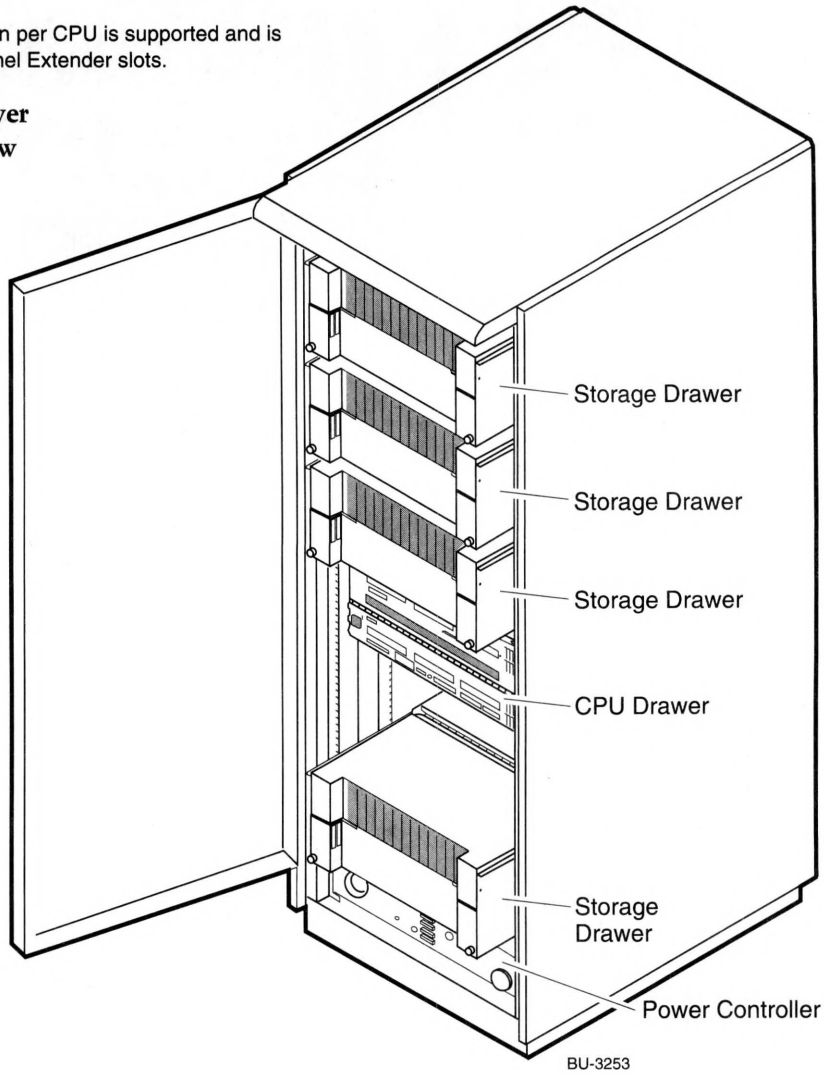
Placement of Storage Devices in Storage Drawer



Note:

- One TURBOchannel Extender option per CPU is supported and is mounted in one of the TURBOchannel Extender slots.

CPU Drawer
Back View



DECsystem 5900
Back View

Chapter 3
Personal Computing

Network Personal Computing---PATHWORKS

PATHWORKS Packaged Servers

PC Networking Hardware

DECpc Personal Computers

applicationDEC 400xP System

applicationDEC 400MP System

Network Personal Computing

Overview

Personal computers are a major part of most organizations' information systems strategies. Yet personal computers, even those on PC LANs, frequently remain isolated from mainstream operations. Clearly, the challenge is to link personal computers completely and cost-effectively into the organization's computing environment.

Digital goes beyond simply connecting PCs to offering true networking of PCs into the enterprise-wide information system. Digital's comprehensive approach to network personal computing is based on an organization-wide architecture and illustrates Digital's ability to provide integration and information-management solutions at every level of computing.

Digital's network personal computing products include the PATHWORKS PC networking products and client/server applications, the DECpc series of 80386- and 80486-based personal computers and networking hardware, and a variety of server systems. These solutions allow users to gain the benefits of network personal computing within a powerful and flexible enterprise-wide environment. They enable PC users to share applications, information, and large system resources such as printers, disks, and CD readers. These solutions even allow PATHWORKS users to share data over local- and wide-area networks with any other user on the network.

Digital's PC networking is highly flexible, accommodating small and large user groups that can grow incrementally without disrupting present users. Digital's PATHWORKS network personal computing products allow users to network any number of DOS, Microsoft Windows, OS/2, or Macintosh PCs, and connect them to multiple servers simultaneously.

The following pages describe the PATHWORKS products and network interface cards that link desktop DOS, Windows, OS/2, and Macintosh systems into productive workgroups and to the enterprise. Also described are LAN-based applications and information about Digital's comprehensive family of industry-standard DECpc personal computers.

PATHWORKS PC Networks

Overview

Today personal computers need to be networked to realize their fullest potential. Sharing files, data, and applications makes PCs more efficient. Without sacrificing their own computing power, networked PCs become smarter and let users make better use of their existing resources.

The PATHWORKS family of network personal computing products creates an environment where multivendor PCs, diverse communications protocols and networks, and diverse applications can work together smoothly and efficiently. The family includes networking software products and packaged server products. These products incorporate all the applications and systems-integration expertise users have come to associate with Digital. They let users access the basic network utilities that best meet their organization's business needs. And they let users take advantage of advanced applications support, management, and integration capabilities that add substantial value to those basic utilities.

PATHWORKS products offer much more than the average PC LAN. They give users choices and provide the best integration of these choices. They provide:

- *A choice of client.* Digital integrates the industry-standard PC environment—Windows, DOS, OS/2, and Macintosh—with different servers through its family of PATHWORKS PC networking software.

  Because PATHWORKS uses industry-standard interfaces such as NETBIOS, PC applications work in the PATHWORKS environment. Users can work in the PC environment of their choice using the applications they want.
- *A choice of server.* Digital offers a full range of scalable servers based on INTEL, RISC, and VAX architectures and running the OS/2, UNIX, and VMS operating systems.

  Users can receive file, print, and applications services from a wide range of scalable servers that provide LAN and WAN functionality, as well as the functionality users need for production-mode applications.

  PC users can connect to any and multiple servers at the same time, if needed, giving them the functionality they need for the appropriate server platform.
- *A choice of network.* PATHWORKS supports a broad range of networking technologies and network transports.

  For local area communications, PATHWORKS supports the IPX, AppleTalk, and NetBEUI protocols. For local- and wide-area communications, PATHWORKS supports the DECnet and TCP/IP protocols. PATHWORKS users also gain wide-area access through X.25 and SNA gateways.

  PATHWORKS provides users flexibility through a choice of network wiring—ThinWire, thick wire, and Unshielded Twisted Pair Ethernet, 802.5/Token Ring and LocalTalk, and FDDI as backbone LAN technology.
- *A choice of network operating system (NOS).* PATHWORKS supports LAN Manager and AppleShare for basic network operating system utilities, such as file and print services. Digital is continuing to add support for industry-standard network operating systems, such as NetWare file and print services.
- *Resource Sharing* with other types of desktop users, such as terminal users and UNIX (NFS) and VMS workstation users, or PC users on other third-party LANs.
- *Easier data access and exchange.* Personal computer files stored on server systems anywhere on the network are directly accessible from any PC or terminal on the network. DOS, OS/2, and Macintosh clients can also share files on a peer-to-peer basis.
- *Efficient distribution of programs, data, and services.* PC applications and data can be stored on large systems and shared by many personal computer users. PATHWORKS products also provide communications services, electronic mail, text editors (for OS/2 and DOS systems), and terminal emulation.
- *Better use of resources.* Networked PCs allow users to share storage, printers, plotters, gateways, and other devices with other users on the network. Yet most processing occurs on the desktop, not on the host system. This means better service at a lower cost per user.
- *Simplified, central management of personal computing.* Resources can be allocated on a group rather than an individual basis. The system administrator can control access to the network, data, applications, and resources. Using management facilities for DECnet and TCP/IP, system administrators can also manage local and remote LANs. Administrators can also perform remote software installations and updates and centralized file backups.
- *Smoother, faster data flow.* High-speed connections and distributed applications improve personal and departmental effectiveness.
- *A clear, consistent growth path.* Digital's networked PC products can solve users' computing needs of today and tomorrow. There's virtually no limit on expansion. Users can add clients, servers, and resources as needed—without disrupting users.

PATHWORKS adds value to the choice of basic PC network utilities through:

- Its support for business-critical—or production-mode—applications. PATHWORKS is designed to be the ideal platform for database access, distributed transaction processing, and other production-mode, client/server applications.

  Client/server applications allow users to optimize their resource utilization. Users can take advantage of the interface and power of their PCs as well as the compute power of the back-end server machines.
- Its multivendor, enterprise-wide integration capabilities for applications, networks, electronic mail, and services. This enables customers to focus on future growth requirements as well as addressing current needs.
- Its peer-to-peer networking capabilities. Users can access both local and remote resources—such as multiple servers, printers, gateways and corporate data—directly. The technologies used are transparent to the end user. And, the network is robust, providing up-time reliability for local and wide area access.
- Its multivendor management via system management, remote software installations and updates, and centralized file backups. In addition, PATHWORKS can take advantage of Digital's rich network management capabilities.

Client/Server Relationship

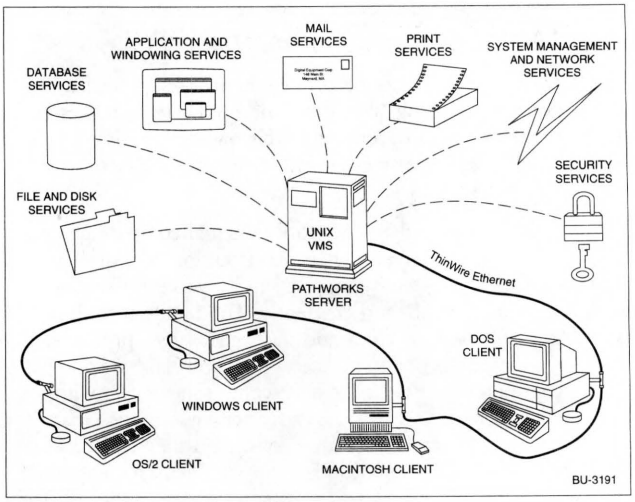
A PATHWORKS client receives system software, PC applications, storage, and printer resources from PATHWORKS servers located anywhere on the network. Once the network link is established, the PC system software and applications run on the PC while accessing applications and files from virtual disks located on the server system. As far as the PC user is concerned, it's as simple as changing drives for DOS, Windows, and OS/2 users or switching volumes for Macintosh users. It doesn't matter where the server is located or what type of operating system it runs. The networking is totally transparent.

The following table shows the PATHWORKS servers and the clients each supports. These products are discussed in the following pages.

Server	Transport	File Protocol	Client
PATHWORKS for VMS	DECnet TCP/IP	LAN Manager	PATHWORKS for DOS, Windows PATHWORKS for OS/2
PATHWORKS for VMS (Macintosh)*	DECnet AppleTalk	AFP	PATHWORKS for Macintosh*
PATHWORKS for OS/2	DECnet TCP/IP NetBEUI	LAN Manager	PATHWORKS for DOS, Windows PATHWORKS for OS/2
PATHWORKS for ULTRIX	DECnet TCP/IP	LAN Manager	PATHWORKS for DOS, Windows PATHWORKS for OS/2
Pacer for ULTRIX	AppleTalk	AFP	PATHWORKS for Macintosh

* This software supports DECnet and AppleTalk communications and supports TCP/IP with MacX. The file and print services run over AppleTalk.

Note: Third-party products available for Macintosh systems support ULTRIX servers.



PATHWORKS Client Software

Overview

PATHWORKS client software allows personal computers to participate in the enterprise network. A user's favorite desktop computer can use file, print, and mail services provided by PATHWORKS server software running on OS/2, ULTRIX, or VMS platforms. And users don't have to learn anything new. The network services provided by PATHWORKS software are simply an extension of their familiar PC environment.

Each client PC must be licensed to access any PATHWORKS server anywhere on the network.

PATHWORKS for DOS and Windows

With PATHWORKS for DOS client software, PC users can continue to use Microsoft Windows (V3.0 and V3.1) and the DOS command line when they connect into an organization's network. This client software gives a broad choice of networks: it supports LAN Manager V2.0 for access to file and print services and the APIs; DECnet and TCP/IP transports over Ethernet and 802.5/Token Ring networks; NETBIOS, both on the PC and on VMS servers, for task-to-task and multitask communications; and Network Device Interface Specification (NDIS) support for network interface cards.

PATHWORKS for DOS users can run Network Application Support (NAS) client-server applications such as the DECquery database query application that uses SQL/Services, PATHWORKS Conferencing software for many-to-many communications, and DECtp Desktop for ACMS software for distributed transaction processing.

PATHWORKS for DOS provides:

- LAN Manager Redirector for access to file and print services on OS/2, ULTRIX, and VMS servers over local- and wide-area networks
- A license for DEC MAILworks for DOS, on X.400 mail clients
- A Mail client, (MAIL-11 front end to VMS mail) including binary file attachments and realtime mail notification
- PC DECwindows Motif, an X Window System server
- VT320 terminal emulation (character cell and windowed versions) that allows multiple sessions
- NETBIOS programming interface support for task-to-task and multitask communication
- DOS utilities (backup and restore, loadable text and graphics fonts, and print screen capabilities)
- A remote boot facility for use with VMS servers
- Support for Expanded Memory Specification Version 4.0
- Access to InfoServer 100 and 150 CD-ROM drives.

Licensing

Each PATHWORKS client must have a PATHWORKS for DOS client license or a PATHWORKS for Windows client license.

The PATHWORKS for DOS license includes the right to use PATHWORKS for DOS client software on a single DOS personal computer and to use the PATHWORKS for VMS and PATHWORKS for ULTRIX server software on one or more server systems. This license also grants the right to use the DEC MAILworks for DOS (X.400 mail client) and PATHWORKS for DOS (NetWare Coexistence) products. (The DEC MAILworks for DOS client media and documentation kit must be purchased separately; see page 3.12 for details. A separate DEC MAILworks server license and media and documentation kit are required to use the server-based mail software.)

For a DOS client to use TCP/IP networking, users must also purchase PATHWORKS for DOS (TCP/IP) client add-on license software, described below.

For Microsoft Windows users, the PATHWORKS for Windows combination license contains both the PATHWORKS for DOS client license and the DEC MAILworks for Windows (X.400 mail) license. (The DEC MAILworks for Windows client and server media and documentation kit must be purchased separately; see page 3.11 for details.)

Client License

QL-0TLA9-AA PATHWORKS for DOS client license
QP-LBJAA-01 PATHWORKS for Windows client license package: contains PATHWORKS for DOS license and DEC MAILworks for Windows license.

Media and Documentation for Network Use

QA-0TLAA-H5/HM PATHWORKS for DOS and PATHWORKS for Windows media and documentation for VMS server (TK50/magtape)
QA-0TLAE-H5/HM PATHWORKS for DOS and PATHWORKS for Windows media and documentation for ULTRIX server (TK50/magtape)

Media and Documentation for Local Hard Disk Use

Order one of these kits to use the PATHWORKS for DOS product with an OS/2 server, or to load client software onto a hard disk.

QA-0TLAA-H7/HB PATHWORKS for DOS media and documentation (RX33/RX24)

Additional Documentation

The media and documentation kits listed above contain a complete documentation set. Order the following documentation kits only if an extra set of documentation is required.

QA-0TLAB-GZ PATHWORKS for DOS complete documentation (for VMS server)
QA-0TLAE-GZ PATHWORKS for DOS complete documentation (for ULTRIX server)
QA-0TLAC-GZ PATHWORKS for DOS complete documentation (for OS/2 server)
QA-0TLAA-GZ PATHWORKS for DOS user documentation: User's Handbook, MAIL User's Reference, SEDT User's Reference, Client Command Reference, PC DECwindows Motif Guide, Microsoft Windows Support Guide, SETHOST Terminal Emulation Guide, Microsoft LAN Manager's User's Guide for MS-DOS.
QA-0TLAD-GZ PATHWORKS for DOS DECnet-DOS documentation: SETHOST Terminal Emulation Guide, DECnet User's Guide, DECnet Network Management Guide.
AA-PAF7C-TK PATHWORKS for DOS User's Handbook

Programmer's Guide

AA-PAFJC-TK DECnet Programmer's Guide

PATHWORKS for DOS (TCP/IP)

PATHWORKS for DOS (TCP/IP) networking software option enables PATHWORKS for DOS clients to participate in a TCP/IP network environment. Featuring an industry-standard RFC 1001/1002 NETBIOS implementation, PATHWORKS for DOS (TCP/IP) lets users use industry-standard applications.

With this network transport option, PC users in TCP/IP networks can access the file and print services offered by PATHWORKS for VMS, ULTRIX, and OS/2 servers and use the mail services of PATHWORKS for ULTRIX.

This networking software also provides

- Telnet protocol for the PATHWORKS terminal emulators
- File Transfer Protocol (FTP) and Trivial File Transfer Protocol (TFTP) to perform network file operations
- Various TCP/IP network management tools such as PING, ARP, and NETSTAT
- A Berkeley Software Distribution (BSD) V4.3 compatible socket library, allowing developers to create or port PC applications that use UNIX socket library calls
- The Domain Name Resolver, which allows applications to use domain names rather than Internet addresses
- Memory-saving techniques
- A Windows socket library

Licensing

Each DOS client must be licensed to use the PATHWORKS for DOS (TCP/IP) product. The PATHWORKS for DOS (TCP/IP) license grants the right to use the TCP/IP network transport on a single DOS personal computer. The PATHWORKS for DOS client license is a prerequisite for the TCP/IP add-on license.

Client License

QL-YV9AW-AA PATHWORKS for DOS (TCP/IP) client license

Media and Documentation

QA-YV9AA-HW PATHWORKS for DOS (TCP/IP) media and documentation. (The PATHWORKS for DOS client media and documentation kit is a prerequisite for this product.)
QA-YV9AA-GZ PATHWORKS for DOS (TCP/IP) User's Reference (included in media and documentation kit)
AA-PESZB-TK PATHWORKS for DOS (TCP/IP) Programmer's Reference Guide

PATHWORKS for DOS (NetWare Coexistence)

PATHWORKS for DOS (NetWare Coexistence) lets PATHWORKS for DOS operate concurrently with Novell's NetWare client software (shell) on PCs running the DOS operating system and using a single Ethernet or Token Ring network interface card. To use this product, a PC client platform must:

- Meet the hardware, software, and network topology requirements of PATHWORKS for DOS client
- Satisfy the network topology requirements of a NetWare DOS client platform for Advanced NetWare V2.15, NetWare V2.2, NetWare 386 V3.1, NetWare V3.11, or NetWare for VMS V2.1
- Have an Ethernet or Token Ring card for which an NDIS-compliant driver is available. All of Digital's EtherWORKS cards meet this requirement.

The PATHWORKS for DOS (NetWare Coexistence) client kit includes:

- NetWare driver components that can be used to generate an IPX driver that uses the NDIS interface
- An installation procedure that, together with the documentation, guides a system manager through the entire installation and configuration process.
- Documentation describing how to install, configure, and use the PATHWORKS for DOS facilities while retaining access to NetWare capabilities

Prerequisites

For clients in a Token Ring LAN, PATHWORKS for DOS V4.1 is a prerequisite. For clients in Ethernet networks, PATHWORKS for DOS V4.0 or V4.1 is required.

License

The license for this product is included with the license for PATHWORKS for DOS V4.0 or later.

Media and Documentation

QA-GLVAA-HW PATHWORKS for DOS (NetWare Coexistence) media and documentation (RX31 and RX24)

Documentation

QA-GLVAA-GZ PATHWORKS for DOS (NetWare Coexistence) documentation only (included in media and documentation kit)

PATHWORKS Access Solution for TCP/IP

PATHWORKS Access Solution (PAS) is a family of products that allow non-Digital TCP/IP for VMS software to be used with PATHWORKS for VMS server software. These products also allow non-Digital TCP/IP client software to use PATHWORKS servers. Developed by InterConnections, Inc. in cooperation with Digital, PAS provides compatibility between the PATHWORKS for VMS server and non-Digital TCP/IP software.

PAS for TCP/IP supports the following transport software and TCP/IP clients:

VMS TCP/IP Transport	PC TCP/IP Client
TGV MultiNet	PATHWORKS for DOS (TCP/IP)
Wollongong WIN	3COM PC TCP/IP
Network Research Fusion	Ungermann-Bass PC TCP/IP
DEC TCP/IP Services for VMS	

PAS supports any combination of the above client and server software and does not affect PATHWORKS DECnet support. To the PATHWORKS server, all the clients look the same. This means PATHWORKS for DOS, PATHWORKS for DOS (TCP/IP), 3Com, and Ungermann-Bass clients can all use the same server at the same time.

PAS requires VMS V5.3 or higher and PATHWORKS for VMS V4.0 or higher installed and operational on the VMS server. In addition, users will need either Digital's DEC TCP/IP Services for VMS as the TCP/IP software for the VMS server or Network Research Fusion V3.4 or higher, Wollongong WIN/VMS V5.1 or higher, TGV MultiNet V2.2 or higher, or Digital's DEC TCP/IP Services for VMS for use with 3Com or Ungermann-Bass clients. They will also need PATHWORKS for DOS and the PATHWORKS for DOS (TCP/IP) add-on.

On a client system, users need either PATHWORKS for DOS and PATHWORKS for DOS (TCP/IP) add-on, 3Com TCP/IP client, or Ungermann-Bass TCP/IP client. There is no version dependency for the PC TCP/IP client.

(Continued)

PATHWORKS Access Solution for TCP/IP *(Continued)*

Licensing

Each VMS server and PC client using PAS must be licensed.

Media and Server License

QB-XY1AV-WA PAS for Fusion (TK50): allows Network Research Fusion to be used as the VMS TCP/IP software with a PATHWORKS for VMS server.
QB-XY2AV-WA PAS for MultiNet (TK50): allows TGV MultiNet to be used as the VMS TCP/IP software with a PATHWORKS for VMS server.
QB-XY3AV-WA PAS for WIN/VMS (TK50): allows Wollongong WIN/VMS to be used as the VMS TCP/IP software with a PATHWORKS for VMS server.
QB-XY4AV-WA PAS for UCX, 3Com and Ungermann-Bass (TK50): allows a VMS server using DEC TCP/IP Services for VMS as its TCP/IP software to work with 3Com and Ungermann-Bass clients.

Client License

Q6VXX-CZ PAS TCP/IP client license (five PC license pack)

PATHWORKS for OS/2

PATHWORKS for OS/2 software lets an OS/2 system be a client to an OS/2, ULTRIX, or VMS system running PATHWORKS server software. OS/2 clients can then use selected resources and services of those systems and access information and services from other PATHWORKS servers on the enterprise network.

PATHWORKS for OS/2 supports multiple concurrent transports: NetBEUI, DECnet, and TCP/IP, in Ethernet and 802.5/Token Ring networks, and supports source routing bridges between Token Rings. It also supports the NETBIOS interface (on the PC and on VMS servers) for task-to-task and multitask communication; and the Network Device Interface Specification (NDIS) for network interface cards.

PATHWORKS for OS/2 provides the following client capabilities to OS/2 users:

- Full LAN Manager, including LAN Manager Redirector for access to file and print services on OS/2, ULTRIX, and VMS servers, over local and wide area networks
- Mail utility, including binary file attachments and realtime mail notification
- VT320 terminal emulation that allows multiple sessions to VMS and ULTRIX hosts

Users of OS/2 Standard Edition V1.1, V1.21, and V1.3 are supported as clients. OS/2 Extended Edition V1.3 users can connect to all PATHWORKS servers via DECnet over Ethernet by using the LAN Requester; to PATHWORKS for OS/2 servers via NetBEUI over Token Ring; and to services of IBM hosts via the IBM Communications Manager as well.

Note: PATHWORKS for OS/2 software also provides server capabilities, which are described in the PATHWORKS Server section.

Configuration Requirements

PATHWORKS for OS/2 requires an 80286, 80386, or 80486 processor with 4 Mbytes of system memory for client configurations and 6 Mbytes of system memory for server or peer services configurations. A hard disk with 8 Mbytes of available space and an Ethernet or Token Ring adapter card are also required.

Licensing

One media and documentation kit provides both OS/2 client and OS/2 server capabilities. However, there are two separate licenses. Each OS/2 client requires a client license (QL-YFWAW-AA). Each OS/2 server requires a server license (QL-YLXAW-AA). An OS/2 client or server running TCP/IP requires a PATHWORKS for OS/2 (TCP/IP) license (QL-XV7AW-AA).

Licenses

QL-YFWAW-AA PATHWORKS for OS/2 client license: gives users the right to use PATHWORKS for OS/2 client software on a single PC as well as PATHWORKS for VMS and ULTRIX server software.
QL-YLXAW-AA PATHWORKS for OS/2 server license: offers DOS and OS/2 clients access to the licensed server's local storage or print devices. Each client must also be licensed.

Media and Documentation

Note: These kits contain the media and documentation for both the server and client products.

QA-YFWAA-HC/H7 PATHWORKS for OS/2 client and server media and documentation (RX23/RX33)

Additional Documentation

QA-YFWAA-GZ PATHWORKS for OS/2 user documentation: Installation and Configuration Guide, User's Guide, Utilities Guide, LAN Manager User's Guide, LAN Manager's Administrator's Guide, LAN Manager's Administrator's Reference, Mail User's Guide, SEDT User's Guide, SETHOST Terminal Emulation Guide, Network Management Guide, Network Troubleshooting Guide, and DECnet for OS/2 Network Management Guide.
Note: The media and documentation kits listed above contain these documents.

Programmer Documentation

QA-YFWAB-GZ PATHWORKS for OS/2 programmer documentation: DECnet for OS/2 Programmer Reference Manual and LAN Manager Programmer Reference Manual.

PATHWORKS for OS/2 (TCP/IP)

PATHWORKS for OS/2 (TCP/IP) networking software option enables PATHWORKS for OS/2 clients to participate in a TCP/IP networked environment. Featuring an industry-standard RFC 1001/1002 NETBIOS implementation, PATHWORKS for OS/2 (TCP/IP) lets users use industry-standard applications.

With this network transport option, PC users in TCP/IP networks can access the file and print services offered by PATHWORKS for VMS, ULTRIX, and OS/2 servers; use the mail services of PATHWORKS for ULTRIX and OS/2 servers.

This networking software also provides:

- Telnet protocol for the PATHWORKS terminal emulators
- File Transfer Protocol (FTP) to perform network file operations
- Various TCP/IP network management tools such as PING, ARP, and NETSTAT

Licensing

In addition to being licensed to use the PATHWORKS for OS/2 product as either a client or server, each OS/2 system must also be licensed to use the PATHWORKS for OS/2 (TCP/IP) product.

License

QL-XV7AW-AA PATHWORKS for OS/2 (TCP/IP) license: gives users the right to use the TCP/IP network transport on a single OS/2 system.

Media and Documentation

QA-XV7AA-HW PATHWORKS for OS/2 media and documentation (5.25- and 3.5-inch disks); includes the TCP/IP network stack and various network management facilities. The PATHWORKS for OS/2 media and documentation kit is a prerequisite for the PATHWORKS for OS/2 (TCP/IP) product.

PATHWORKS for Macintosh

Developed jointly by Digital Equipment Corporation and Apple Computer, Inc., PATHWORKS for Macintosh gives users the best of both worlds: easy access to Digital's enterprise-wide capabilities while using their familiar Macintosh interface.

With PATHWORKS software, Macintosh users can access remote resources—file and print services, databases, electronic mail, and network services—on a local- or wide-area network.

The PATHWORKS software lets Macintosh users communicate with all other users connected to MAILbus. Through terminal emulation and an X Window System server, PATHWORKS provides access to production applications on the network.

PATHWORKS for Macintosh includes the following:

- *Macintosh client application software*
  - Electronic mail: Mail for Macintosh, a VMS Mail client, and a license for DEC MAILworks for Macintosh, an X.400 mail client
  - MacX (1.1.7), an X Window System server for access to DECwindows Motif applications and other X Windows applications.
  - MacTerminal (V3.0) terminal emulator
  - Data Access Language client software
  - AppleTalk-to-LAT transport gateway
  - PATHWORKS Listener
- Connectivity software components
  - DECnet for Macintosh: Network Control Program (NCP), File Access Listener (FAL)
  - Macintosh Communications Toolbox with ADSP tool for AppleTalk connection; transport gateway access tool for AppleTalk to DECnet gateway; DECnet tool; CTERM tool for LocalTalk and wide area terminal emulation; LAT tool for high-speed, local-area terminal emulation; MacTCP tool for TCP/IP connection with MacX; direct serial connection tool; modem tool; text transfer tool; and Xmodem file transfer tool, AppleTalk-to-LAT tool for the ATK-LAT gateway.
- Developer tools
  - Application Programming Interface (API) for AppleTalk for VMS V3.0
  - API for AppleTalk-to-DECnet transport gateway

Configuration Requirements

Ethernet connections can be handled by either Ethernet cards or a LocalTalk-to-Ethernet router. PATHWORKS for Macintosh supports AppleTalk Phase 2-compliant Ethernet cards, including the new Apple Ethernet card. LocalTalk-to-Ethernet routers include the FastPath 4 and 5, Cayman GatorBox CS, Webster Multigate, and Apple's Internet Router.

Hardware Requirements

Macintosh clients can be Macintosh Plus; Macintosh SE and SE/30; Macintosh II, IIx, IIcx, IIci, IIfx, and IIsi; Classic and LC models; Powerbook 100, 140, and 170; Quadra 700 and 900; and the Portable. Digital recommends a Macintosh with 2 Mbytes or more of RAM. For a complete list, see SPD 31.53, PATHWORKS for Macintosh.

Software Requirements

The Macintosh client must be running Macintosh operating system V6.0.5, 6.07, 7.0 or 7.1. DEC MAILworks for Macintosh requires DEC MAILworks Server for VMS.

Licensing

Each Macintosh client system requires a PATHWORKS for Macintosh client license, which conveys the right to use the client software and PATHWORKS for VMS (Macintosh) and Pacer for ULTRIX server software.

License

QL-YPH9W-AA PATHWORKS for Macintosh client license

Media and Documentation

PATHWORKS for Macintosh media and documentation are available in VMS and ULTRIX formats. Order the kit appropriate to the server (VMS or RISC ULTRIX) used.

QA-YPHAA-H5/HM PATHWORKS for Macintosh client media and documentation kit (VMS format) (TK50/magtape)
QA-YPHAB-H5/HM PATHWORKS for Macintosh client media and documentation kit (ULTRIX format) (TK50/magtape)

Additional Documentation

QA-YPHAA-GZ PATHWORKS for Macintosh documentation
QA-YPHAB-GZ PATHWORKS for Macintosh documentation (ULTRIX format)
QA-YPHAC-GZ PATHWORKS for Macintosh user documentation
QA-YPCAC-GZ PATHWORKS for Macintosh programmer's documentation

PATHWORKS Server Software

Overview

The PATHWORKS family of servers provide network operating system services (file and print), information access, network management, and flexibility to client PC users. A single PC client can concurrently access any combination of OS/2, ULTRIX, and VMS server systems. And as users' needs grow, they can add new PCs or new server systems anytime, anywhere, without disrupting their network, buying new software, or changing the way they work.

Some PATHWORKS features are common to all servers. Others are unique to individual operating systems. Common PATHWORKS server features are

- File and print services
- Local-area and wide-area network capabilities over DECnet and TCP/IP
- Electronic mail that lets users communicate with all other users on the network
- Easy PC LAN administration through menus
- Security for PC files stored on the server
- Broadcast utility, allowing a system administrator to send messages to PC users connected to the local area network.
- Date and time services

PATHWORKS for VMS

PATHWORKS for VMS server software enables VAX systems to provide local- and wide-area network services to Windows, DOS, and OS/2 clients. It delivers common PATHWORKS server features while providing broad system management capabilities, support for rich client/server applications, and a choice of networks.

PATHWORKS for VMS enables unattended backup of PC data stored on the file server and remote boot for DOS PCs configured with DECnet-based PATHWORKS and Ethernet network interface cards.

PATHWORKS for VMS software also enables remote management of multiple PC LANs from a single point. In addition, it enables remote system management and supports VMS Access Control Lists so system managers can specify privileges to assigned users.

Users have access to a rich set of distributed applications such as ALL-IN-1 MAIL, the DECquery applications for SQL database access, and DECtp DESKTOP for ACMS transaction processing.

PATHWORKS for VMS supports TCP/IP software. DEC TCP/IP Services for VMS is supported out of the box. Or PATHWORKS Access Solution (see page 3.6) product can be used—Wollongong Win, TGV MultiNet, or Network Research Fusion TCP/IP software. Also, the software supports both Token Ring and Ethernet environments. The server software also provides direct access to the DECnet/SNA Gateway in organizations using the gateway.

Licensing

Each client requires a client license. The Client license conveys the right to use both client and server software.

Media and Documentation

QA-A93AA-H5/HM PATHWORKS for VMS media and documentation (TK50/magtape)

Additional Documentation

QA-A93AA-GZ PATHWORKS for VMS documentation: Installation Guide, Server Administration with Commands, Network Troubleshooting Guide, Server Administration with the Menu, Release Notes.

Note: Media and documentation kits contain these documents.

PATHWORKS for VMS (Macintosh)

Developed jointly by Digital Equipment Corporation and Apple Computer, Inc., PATHWORKS for VMS (Macintosh) server software allows VAX systems to provide local- and wide-area network services to Macintosh clients. VAX computers become servers for file and printer sharing, database access, electronic mail, and network services to large groups of Macintosh clients.

PATHWORKS for VMS (Macintosh) provides file services (which are as familiar as AppleShare services to Macintosh users) that offer the benefits of large disks, regular operator backups, and data security. Additionally, PATHWORKS software lets Macintosh users communicate with all other users connected to MAILbus.

PATHWORKS software gives Macintosh users the best of both worlds: easy access to remote resources on a local- or wide-area network without leaving their familiar desktop environment. Macintosh users can select and use Digital and LaserWriter printers in the same way they select LaserWriter printers connected to an AppleTalk network.

PATHWORKS for VMS (Macintosh) includes the following:

- *VMS server software*
  - VAXshare file services, based on Apple Filing Protocol (AFP)
  - VAXshare print services for Apple LaserWriter, LaserWriter-PLUS, LaserWriter-II/NT, and LaserWriter-II/NTX; Digital's LN03R ScriptPrinter; PrintServer 20 and 40; and DEClaser 1150, 2150, and 3250 printers
  - Network-based file and print server management
  - Data Access Language server software for VMS systems and adapter for Rdb/VMS relational database
  - PATHWORKS mail server
  - AppleTalk for VMS V3.0.1, an AppleTalk Phase 2 implementation
  - AppleTalk-to-DECnet transport gateway
- *Developer tools*
  - Application Programming Interface (API) for AppleTalk for VMS V3.0
  - API for AppleTalk-to-DECnet transport gateway

Software Requirements

VMS V5.3, 5.4, or 5.5.

Licensing

Each Macintosh client requires a client license. The client license gives the Macintosh user the right to use the client and the PATHWORKS for VMS (Macintosh) and Pacer for ULTRIX server software.

Media and Documentation

QA-YPCAA-H5/HM PATHWORKS for VMS (Macintosh) media and documentation (TK50/magtape)

Additional Documentation

QA-YPCAA-GZ PATHWORKS for VMS (Macintosh) documentation

QA-YPCAC-GZ PATHWORKS for Macintosh programmer's documentation

PATHWORKS for ULTRIX

PATHWORKS for ULTRIX server software allows RISC and VAX systems to provide local- and wide-area server features to Windows, DOS, and OS/2 clients. In addition to delivering the common PATHWORKS server features, PATHWORKS for ULTRIX integrates PCs into the UNIX environment by providing SENDMAIL mail addressing and supporting UNIX utilities such as YP (Yellow Pages) and BIND/Hesiod (Berkley Internet Name Domain) for naming.

PATHWORKS for ULTRIX server software also provides shared update of files among PC and UNIX applications by supporting native ULTRIX byte-range locking. This server also delivers ULTRIX enhanced security and allows unattended backup and provides audit log files.

Licensing

Each client accessing a PATHWORKS server requires a client license. The client license conveys the right to use both client and server software.

Media and Documentation

QA-YNGAA-H5/HM PATHWORKS for ULTRIX VAX media and documentation (TK50/magtape)
QA-YNGAB-H5/HM PATHWORKS for ULTRIX RISC media and documentation (TK50/magtape)

Additional Documentation

QA-YNGAA-GZ PATHWORKS for ULTRIX documentation: Server Installation Guide, Server Administrator's Guide, and Network Troubleshooting Guide

Note: Media and documentation kits contain these documents.

Pacer for ULTRIX

Pacer for ULTRIX is a combination of Macintosh-to-ULTRIX connectivity products—PacerShare, PacerPrint and AppleTalk for ULTRIX—developed by Pacer Software and available from Digital.

PacerShare, a network-based file server for Macintosh users, uses AppleTalk Filing Protocol services with the ULTRIX operating system running on RISC systems. For example, with PacerShare a DECstation 3100 can become a fast AppleShare-compatible file server. Macintosh users can connect to the file server through direct Ethernet connections or through a LocalTalk-to-Ethernet router. PacerShare file service supports standard ULTRIX access control and lets the system manager determine on a per-user basis who has access to a file or directory and the type of access that user receives.

PacerPrint is a standard ULTRIX spooling daemon, providing an interface to the print job queue, status reports, and error handling provided by the ULTRIX system. PacerPrint services allow Macintosh and ULTRIX RISC users to share LaserWriter, LN03R, LPS40, LPS20, and other Digital printers.

Prerequisites

Pacer for ULTRIX requires any RISC processor with a standard Ethernet controller and ULTRIX V4.2 operating system. Pacer for ULTRIX is compatible with PATHWORKS for Macintosh V1.1.

Licensing

Each Macintosh system accessing Pacer for ULTRIX must be properly licensed. The PATHWORKS for Macintosh client license grants the right to use Pacer for ULTRIX and to access multiple PATHWORKS and Pacer servers simultaneously.

Media and Documentation

QA-ME9AA-H5/HM Pacer for ULTRIX media and documentation (TK50/magtape)

PATHWORKS for OS/2

PATHWORKS for OS/2 server software provides full Microsoft LAN Manager capabilities for Windows, DOS, and OS/2 clients in Token Ring and Ethernet networks. That means OS/2 systems can function as servers and/or clients. PATHWORKS for OS/2 server software includes the common PATHWORKS server features while supporting LAN Manager's Application Programming Interfaces (APIs), such as Named Pipes, for developing and distributing applications between DOS and OS/2 systems and takes advantage of LAN Manager Peer services. The software also supports multiple concurrent transports, including DECnet, TCP/IP, and NetBEUI.

This software supports TCP/IP through the PATHWORKS for OS/2 (TCP/IP) add-on option. The software also contains DECnet for OS/2 networking software for task-to-task communications, NETBIOS interface support, and network management and diagnostic tools.

PATHWORKS for OS/2 supports OS/2 Standard Edition V1.21 and V1.3, including the High Performance File System (HPFS), on servers.

PATHWORKS for OS/2 requires an 80286, 80386, or 80486 processor with 6 Mbytes of system memory for server or peer services configurations. A hard disk with 8 Mbytes of available space is also required. In addition, the server software requires a network interface card—an Ethernet card, such as Digital's EtherWORKS family of cards, or a Token Ring card, also available from Digital. PATHWORKS for OS/2 runs on any industry-standard PC such as DECpc, IBM AT and PS/2, COMPAQ, Olivetti, Toshiba, and Zenith Data Systems models.

While there is one media and documentation kit for the server and client, there are two separate licenses.

License

QL-YLXAW-AA PATHWORKS for OS/2 server license
QL-YFWAW-AA PATHWORKS for OS/2 client License: gives users the right to use PATHWORKS for OS/2 client software on a single PC as well as PATHWORKS for VMS and ULTRIX server software.

A client license (QL-YFWAW-AA) is required for each OS/2 client system. A server license (QL-YLXAW-AA) is required for each OS/2 server system. A client or server running the PATHWORKS for OS/2 (TCP/IP) option requires a TCP/IP license in addition to the base client or server license.

Media and Documentation

QA-YFWAA-HC/H7 PATHWORKS for OS/2 client and server media and documentation (RX23/RX33)

Additional Documentation

QA-YFWAA-GZ PATHWORKS for OS/2 user documentation: Installation and Configuration Guide, User's Guide, LAN Manager User's Guide, LAN Manager's Administrator's Guide, LAN Manager's Administrator's Reference, Mail User's Guide, SEDT User's Guide, SETHOST Terminal Emulation Guide, Network Management Guide, Network Troubleshooting Guide, and DECnet for OS/2 Network Management Guide. **Note:** The media and documentation kits listed above contain all these documents.
QA-YFWAB-GZ PATHWORKS for OS/2 programmer documentation: DECnet for OS/2 Programmer Reference Manual and LAN Manager Programmer Reference Manual.

Personal Computer Mail Solutions

Overview

Most enterprises today recognize that electronic communication—across computer systems, departments, enterprises, and countries—is vital to competitive health. Yet such organizations also need to ensure that their workers have access to computers and software that support their work styles, personal preferences, job-specific needs, and ranges of technical literacy.

Extending an electronic mail system across such diverse platforms and technologies is the challenge Digital addresses and meets with its DEC MAILworks products for Microsoft Windows, Macintosh, and DOS users and with its Mobilizer for ALL-IN-1 product for portable PCs.

DEC MAILworks for PCs

Taking advantage of Digital's PATHWORKS products for connecting systems, the DEC MAILworks family makes possible a worldwide mail system that supports both X.400-based and proprietary systems. The products implement the CCITT X.400 standards for public and private electronic mail systems.

DEC MAILworks products deliver the following capabilities:

- Full-featured DEC MAILworks capabilities for Microsoft Windows, Macintosh, and DOS systems
- Adherence to CCITT X.400 P1 and P2 User Agent recommendations for multinational, multivendor mail interconnection
- Click-to-Launch feature for starting other applications from within mail on Windows, and Macintosh clients
- Full integration with multivendor mail systems through Digital's MAILbus
- Personal Address Book for easy maintenance of mail addresses and nicknames; easily integrated with the MAILbus Distributed Directory Service for directory support throughout a multivendor network
- Support for any number or type of message attachments
- Sophisticated filing functions for storing messages locally or remotely

Additional features include handling various file formats, configuring messages for maximum readability; online notification of message delivery; priority-based message delivery; message retrieval based on header fields and filing structures; and message redirection to a secondary address.

DEC MAILworks Server

The DEC MAILworks VMS server requires VMS operating system V5.3 or higher, DECnet-VAX V5.3 or higher, PATHWORKS for VMS V4.0, and DEC MAILworks Server for VMS. Optional software includes VAX Message Router, VAX Message Router VMSmail Gateway, or other Message Router gateways. For Macintosh service, PATHWORKS for Macintosh V1.0 (VMS resident component) is required.

QB-YFTA9-AA	DEC MAILworks Server for VMS (single-node server); license, media (TK50), and documentation
QL-YFUA9-JC	DEC MAILworks WAN Server license
QA-YFUAA-H5/HM	DEC MAILworks WAN Server media and documentation (TK50/magtape)

DEC MAILworks for Windows

DEC MAILworks for Windows is a fully functional, graphics-oriented Microsoft Windows application. It features icons, pull-down menus, color, windows, and on-line help. This product allows MAIL to be called from other Windows applications, enabling users to send mail without exiting from the original application. Sample Macros for Word for Windows and Microsoft Excel are included.

The Microsoft Windows client connects to the server over local area networks connected by DECnet.

Prerequisites

PATHWORKS for DOS V4.0 and 4.1 and Microsoft Windows V3.0 or 3.1 configuration that has a minimum of 4 Mbytes of system memory and a hard disk with a minimum of 3.5 Mbytes of free storage in addition to PATHWORKS for DOS requirements; DOS operating system V3.3, 4.0, 4.1 or 5.0; Microsoft Windows V3.0 or 3.1; PATHWORKS for DOS V4.0 or higher; PATHWORKS for Windows includes license.

License

QL-XZJAG-2B	DEC MAILworks for Windows personal use license

Media and Documentation

QB-XZJAA-AA	DEC MAILworks for Windows personal use license, media, and documentation
QA-XZJAA-HB	DEC MAILworks for Windows media (RX24) and documentation

Additional Documentation

QA-XZJAA-GZ	DEC MAILworks for Windows documentation

DEC MAILworks for Macintosh

The DEC MAILworks for Macintosh product is a fully functional Macintosh application for use on any Macintosh system supported by PATHWORKS for Macintosh. Like other Macintosh applications, DEC MAILworks for Macintosh is graphics oriented, using icons, pull-down menus, windows, and on-line help.

The Macintosh client connects to the server through the DECnet network, through the PATHWORKS AppleTalk/DECnet gateway, or remote locations through asynchronous DECnet connections. Mail attachments can include MacBinary files (data fork and resource fork or data fork only), allowing the highest level of interoperability in today's heterogeneous computing environment.

Prerequisite

PATHWORKS for Macintosh (contains the license for DEC MAILworks for Macintosh V1.0 or 1.1)

Media and Documentation

QA-YX1AA-HB	DEC MAILworks for Macintosh media (RX24) and documentation

Additional Documentation

QA-YX1AA-GZ	DEC MAILworks for Macintosh documentation (10 sets)

DEC MAILworks for DOS

This DEC MAILworks product is a DOS character-cell implementation of the DEC MAILworks client software. It can be used on any industry-standard DOS system supported by PATHWORKS for DOS. The license for this client is packaged with PATHWORKS for DOS.

DEC MAILworks for DOS users can connect to the server over local area networks by way of the DECnet network, by dialing in from remote locations through asynchronous DECnet connections, or through asynchronous connections through LAT, X.25 PAD, or dial-up without benefit of DECnet.

Prerequisites

Any valid PATHWORKS for DOS configuration with a minimum of 640 Kbytes of memory (420 Kbytes of free memory is required after loading PATHWORKS for DOS); support for 8-bit characters is provided only on EGA and VGA machines; DOS operating system V3.3 or higher; PATHWORKS for DOS V4.0 or higher (contains the license for DEC MAILworks for DOS)

Media and Documentation

QA-VZ8AA-H7 DEC MAILworks for DOS media (RX33) and documentation

QA-VZ8AA-HB DEC MAILworks for DOS media (RX24) and documentation

Additional Documentation

QA-VZ8AA-GZ DEC MAILworks for DOS documentation (one set)

MOBILIZER for ALL-IN-1

MOBILIZER for ALL-IN-1 allows business travelers to stay in touch with their electronic mail, even when they are out of the office. MOBILIZER for ALL-IN-1 users communicate through the familiar ALL-IN-1 interface, even using distribution lists from their office-based ALL-IN-1 account.

By bringing remote DEC MAILworks capabilities to portable systems, Digital allows the business traveler to stay in touch with the office without suffering through interminable low-speed connections.

MOBILIZER provides basic terminal emulation and bidirectional asynchronous message transfer capabilities between DOS notebook, laptop, and palmtop computers and the ALL-IN-1 Integrated Office System's Mail and File Cabinet V2.3 or V2.4.

Using the ALL-IN-1 IOS as its server, MOBILIZER for ALL-IN-1 simulates an ALL-IN-1 electronic messaging session with a subset of the ALL-IN-1 IOS Electronic Mail, Folder, Nickname, and Distribution List commands.

Software Requirements

Configuration requirements are a VMS account with full DCL access on a VAX server running VMS V5.1 or higher (including VMS Required Saveset and VMS Utilities Saveset) and ALL-IN-1 V2.3 or higher.

Hardware Requirements

The PC requires 1-Mbyte RAM, 512-Kbytes storage (in addition to space for MS-KERMIT) and MS-DOS V3.3 or higher. The right to use the server is included in the client license.

Server Media and Documentation

QA-XWWAA-H5/HM MOBILIZER for ALL-IN-1 VAX VMS Server media and documentation (TK50/magtape)

Client License

QL-XWXAW-AA MOBILIZER for ALL-IN-1 DOS PC client license

Client Media and Documentation

QA-XWXAA-HB MOBILIZER for ALL-IN-1 DOS client media (RX24) and documentation

POQET Software License

QL-XWXAX-AA MOBILIZER for ALL-IN-1 DOS POQET client license

POQET Media and Documentation

QA-XWXAA-HS MOBILIZER for ALL-IN-1 DOS POQET media (RX24) and documentation

Additional Documentation

QA-XWWAA-GZ MOBILIZER for ALL-IN-1 server documentation

QA-XWXAA-GZ MOBILIZER for ALL-IN-1 DOS documentation

QA-XWXAB-GZ MOBILIZER for ALL-IN-1 DOS POQET documentation

PATHWORKS Links for Windows

PATHWORKS Links for Windows is a set of Microsoft Windows applications that run on PATHWORKS for DOS or PATHWORKS for Windows. PATHWORKS Links includes two components: PATHWORKS Conferencing for Windows and Browser for Windows. PATHWORKS links with MAIL includes three components: PATHWORKS Conferencing for Windows, PATHWORKS Browser for Windows and DEC MAILworks for Windows.

When these components are integrated into a PATHWORKS LAN, users receive benefits that surpass the sum of the parts. PATHWORKS Links for Windows enables users to improve personal productivity and improve their ability to navigate the network and work as a team with other users on the network.

Conferencing for Windows, also available separately (see page 3.14), is a client to the VAX Notes services available on the PATHWORKS server. This product enables groups to set up electronic conferences for sharing information regardless of time, location, or type of desktop.

Browser for Windows, also available separately (see page 3.13), allows a user easy access to DOS files anywhere on the wide-area network, regardless of the application used to produce the information. This product provides users with a global view of their files across multiple disks and directories. PATHWORKS Browser provides simple information-retrieval capabilities as well as more sophisticated browsing based on content.

Browser includes viewing and conversion services for the PC environment. It can handle all the intricacies determining how and when conversions take place. For a complete list of supported viewers and converters refer to the PATHWORKS Browser SPD 37.42.

PATHWORKS Links for Windows with MAIL options provides X.400 mail capabilities to Microsoft Windows users. This component enables Microsoft Windows users to exchange electronic mail with PC, Macintosh, workstation, and video terminal users. In addition, users can exchange mail with users of the ALL-IN-1 Integrated Office System, ULTRIX, VMSmail, PROFS, SNADS, DISOSS, and other mail systems that support the X.400 standard or Digital's MAILbus. See page 3.11 for more information about DEC MAILworks for Windows.

Software Requirements

PATHWORKS Links for Windows requires PATHWORKS for DOS client software, Microsoft Windows V3.x, PATHWORKS for VMS server software, and the VMS Notes Server. Additionally, if you have PATHWORKS Links with MAIL for Windows, the DEC MAILworks Server and VAX Message Router are required.

License

QL-MEBAG-2B PATHWORKS Links for Windows (includes PATHWORKS Browser and PATHWORKS Conferencing) personal use license
QL-MCUAG-2B PATHWORKS Links for Windows with MAIL (includes PATHWORKS Browser, PATHWORKS Conferencing, and DEC MAILworks for Windows) personal use license

Media and Documentation

QB-MEBAA-SA PATHWORKS Links (includes PATHWORKS Browser and PATHWORKS Conferencing) media, documentation, and license
QA-MEBAA-HB PATHWORKS Links (includes PATHWORKS Browser and PATHWORKS Conferencing) media and documentation
QB-MCUAA-SA PATHWORKS Links (includes PATHWORKS Browser, PATHWORKS Conferencing, and DEC MAILworks for Windows) media, documentation, and license
QA-MCUAA-HB PATHWORKS Links (includes PATHWORKS Browser, PATHWORKS Conferencing, and DEC MAILworks for Windows) media (RX24) and documentation

Additional Documentation

QA-MEBAA-GZ PATHWORKS Links (includes PATHWORKS Browser and PATHWORKS Conferencing) documentation
QA-MCUAA-GZ PATHWORKS Links (includes PATHWORKS Browser, PATHWORKS Conferencing, and DEC MAILworks for Windows) documentation

Browser for Windows

Browser for Windows extends the file management capabilities for navigating PC and/or network drives. The Browser lets users access, view, convert, and locate information anywhere on their systems.

Users can access files on the local PC as well as disks anywhere in a LAN-based network, thus offering true distributed processing capabilities (a PC LAN connection is required for this support).

The Browser viewing and conversion services can be integrated with some leading conversion programs. A common user interface is presented which "front-ends" the appropriate viewing and conversion service for that format. For a complete list of viewers and converters, see SPD 37.42.

Browser provides many ways to locate information. Filters mask (block out) unwanted information and allow users to obtain detailed information quickly. For example, filtering is used in a large directory containing many file types when users want to see only specific file types.

Other features include:

- Easy-to-Use Menus and Online Help

  Browser is layered on Microsoft Windows. All functions can be accessed by easy-to-use pull-down menus or pushbuttons. Dialog boxes are used to input information.

  Context-sensitive Help allows users to use the mouse to point and click a pull-down menu item to get help. This feature is an extension of extensive online Help documentation.
- Mail Integration

  Browser supports DEC MAILworks for Windows or PATHWORKS MAIL to enable users to send electronic mail or messages to other users on the network using cc:Mail for Windows and Microsoft MAIL.
- Use in a Network or on a Standalone PC

  Browser is an application that is layered on Microsoft Windows. Optionally, Browser software is also designed for use in any PC LAN such as NetWare, LAN Manager, Vines, or PATHWORKS.
- Accelerator Buttons

  Accelerator buttons give users quick access to frequently used menu options.
- Ability to Customize the Environment

  Users can customize Browser to fit their needs and computing styles.

(Continued)

Browser for Windows *(Continued)*

- Flexible File Filtering and Searching

  The Browser search capability facilitates locating information within files located on multiple directories, including network drives. Users can search for:

  - Partial file names (starts/ends with, contains)
  - File content (contains/equals)
  - Creation dates (on, before, or after a specified time)
  - File size (equal, greater than, smaller than)

License

QL-MCVAG-2B	Browser for Windows personal use license

Media and Documentation

QB-MCVAA-AA	Browser for Windows personal use license, media, and documentation
QA-MCVAA-HB	Browser for Windows media (RX24) and documentation

Additional Documentation

QA-MCVAA-GZ	PATHWORKS Links for Windows documentation

Conferencing for Windows

PATHWORKS Conferencing for Windows enables Microsoft Windows users to set up an electronic conference for sharing information regardless of time or location. Computer conferencing is a proven, computer supported, electronic messaging technology. Conferencing can be used for a variety of applications such as an electronic bulletin board, collaborative document authoring and review, and internal classes or seminars.

Features

- Distributed Access

  PATHWORKS Conferencing clients can access VAX Notes conferences on any VAX Notes server node in a DECnet network, therefore offering true distributed processing capability.

- Easy to Use

  PATHWORKS Conferencing is layered on Microsoft Windows. All functions can be accessed by easy-to-use pull-down menus or pushbuttons. Dialog boxes are used to input information.

  PATHWORKS Conferencing is designed for inexperienced users. On-line Help and tutorial documentation assists in familiarizing new users with PATHWORKS Conferencing quickly and easily.

- Built-in Editor

  The PATHWORKS Conferencing client has a built-in editor, so users can create their own topics and replies without leaving the application.

- Imported Text

  PATHWORKS Conferencing allows topics and replies to be created outside of the PATHWORKS Conferencing application (using any editor that can produce ASCII output files) and then later imported into the conference.

- Mail Integration

  PATHWORKS Conferencing supports the DEC MAILworks for Windows or PATHWORKS MAIL to allow users to send notes to other users from within VAX Notes.

  PATHWORKS Conferencing, one of the components of PATHWORKS Links for Windows is also available separately.

The PATHWORKS Conferencing software is designed or use in a client/server environment. The following server products are required:

- VAX Notes
- PATHWORKS for VMS

A DECnet connection to a VAX Notes server is required. PATHWORKS for DOS communication software is required.

License

QL-MCWAG-2B	PATHWORKS Conferencing for Windows personal use license

Media and Documentation

QB-MCWAA-SA	PATHWORKS Conferencing for Windows personal use license, media, and documentation
QA-MCWAA-HB	PATHWORKS Conferencing for Windows media (RX24) and documentation

PATHWORKS Desktop Backup

Digital's PATHWORKS Desktop Backup product is a high-performance, low-cost, easy-to-use network backup solution providing backup and restore services to network-attached personal computers.

PATHWORKS Desktop Backup uses a client/server layered software approach to provide unattended backup of multiple PCs to one or more servers. Typical clients are IBM or IBM-compatible PCs that have local disks with backup requirements. For V1.0, clients must use MS-DOS as an operating system and may optionally use Windows 3.0. A typical server is VAX VMS platform with any supported tape drive; multiple clients on the network can be backed up by a single Desktop Backup Server system. The server writes VMS backup-compatible savesets.

It supports VAX VMS servers, PATHWORKS for DOS clients, and PATHWORKS for DOS with Microsoft Windows 3.0 clients.

Features

- Easy-to-use graphical user interface
- Supports both unattended or attended backup
- Allows for grouping several client backups into a single backup job
- Flexible scheduling of backups with automatic rescheduling
- Backup history database for lookup of previously saved files
- For each client, files can be specified to be backed up or restored or can be specifically excluded from the backup process.
- Backup administrator can access system logs of events, such as when backups have occurred.
- System security features to maintain confidentiality of data.

Benefits

- Protects valuable organizational data, which is increasingly resident on personal computers
- Increases user productivity by:
  - Eliminating the need for users to backup their own client software or data.
  - Allowing file restorations on demand at any time

(Continued)

PATHWORKS Desktop Backup *(Continued)*

- Increases backup administrator flexibility—PCs on a network can now be scheduled and backed up similarly to a large computer system. Unattended backups can be scheduled at times when applications are not running.
- Maintains system security—Backup administrators maintain a high level of system security through passwords and system registration.
- VMS backup saveset format facilitates emergency file restoration on any VAX VMS system, ensuring higher data availability.

Hardware Prerequisites

Any VAX VMS servers
IBM or IBM-compatible PCs

Software Prerequisites

PATHWORKS for DOS Clients, Version 4.0 or higher
PATHWORKS for DOS with Microsoft Windows Clients (optional)

Resources

SPD 41.52, SPD 41.55

Ordering Information

QL-MR1A9-A9	Software license for server, any VAX
QL-MR2AW-2B	Software license for PC, client
QA-MR1AA-H5.1.0	PATHWORKS desktop backup for VMS server (TK50)
QA-MR1AA-HM.1.0	PATHWORKS desktop backup for VMS server (magtape)
QA-MR2AA-H7.1.0	PATHWORKS desktop backup for DOS (5.25-inch diskettes)
QA-MR2AA-HB.1.0	PATHWORKS desktop backup for DOS (3.25-inch diskettes)

Additional Documentation

QA-MCWAA-GZ	PATHWORKS Links for Windows documentation

eXcursion for Windows

eXcursion for Windows enables a Microsoft Windows user to display and control X Window applications on a PC within the Microsoft Windows environment. This product is a full implementation of the MIT X Windows Version 11 Release 4 server and provides local Microsoft Windows window management and control for applications based on DECwindows Motif, Open Look, or other X-11 toolkit implementations.

Components

- eXcursion for Windows server software
- Installation utility
- Program start utility for DECnet
- Dynamic Link Libraries (DLL) for network communications
- *eXcursion for Windows User Guide, Quick Start Card* plus extensive online help.
- DECwindows Motif, MIT, Open Look fonts, and OSF/Motif
- Keyboard mapping files
- Template initialization file

Features

- Separate application windows for each X application displayed by the X server
- eXcursion Setup Utility for installing eXcursion under Microsoft Windows
- Option to add X application icons to a Microsoft Windows Program Manager group
- eXcursion Control Panel for easy access to X application and customization features
- Extensive online help including answers to questions about setting up or using eXcursion
- Cut and paste text or graphics between X applications and Microsoft Windows applications
- Support for VGA and higher resolution monitors
- Display up to 256 colors with the appropriate graphics controller
- Complete library of fonts to use with X applications (both 75 and 100 dots per inch)
- Compile new fonts from source files, if needed for a particular application
- Redefine the use of one or more keys on the keyboard
- Specify a personal password for access to eXcursion
- Microsoft Windows manages the X window applications
- Three-button mouse emulation

eXcursion for Windows application software is layered on Microsoft Windows, creating a unified operating environment where PC users can take advantage of X applications without learning a new interface.

eXcursion for Windows allows a personal computer running the DOS operating system and Microsoft Windows to use X client applications available from a remote system, using DECnet or TCP/IP protocols. eXcursion for Windows supports PATHWORKS for DOS (TCP/IP), 3Com TCP with Demand Protocol Architecture or FTP PC/TCP TCP/IP stacks. eXcursion for Windows supports PATHWORKS for DOS using the DECnet protocol.

Software Requirements

eXcursion for Windows is a layered application on Microsoft Windows; it requires Microsoft Windows V3.0 or V3.1.

The eXcursion for Windows software supports DECnet and TCP/IP communication environments. One of the following communications software packages is required:

- DECnet using PATHWORKS for DOS (V4.0 or higher)
- TCP/IP using PATHWORKS for DOS (TCP/IP) (V1.0 or higher)
- TCP/IP using PC/TCP from FTP Software, Inc. (V2.05 or higher)
- TCP/IP using 3Com TCP with Demand Protocol Architecture (V1.2 or higher)

Media and Documentation

QA-MG7AA-AB	eXcursion for Windows, (RX33) media
QA-MG7AA-AA	eXcursion for Windows, (RX24) media

Vivace for Windows Version

Vivace for Windows is an object-oriented, customizable desktop manager that helps Microsoft Windows users work more easily with multiple applications, network services, and large numbers of documents. Vivace runs on standalone personal computers and on any PC LAN.

Vivace creates a customized representation of the user's personal work environment. Vivace uses icons to depict file cabinets, documents, applications, network services, printers, FAX machines, CD-ROM drives, and other peripherals.

The desktop manager enables users to search for documents in archives stored on PCs or PC LANs, basing their search on document content, name, description, creation date, or location—regardless of what application produced the documents.

Vivace currently is available in eight languages: Dutch, English (U.K.), English (U.S.), French, German, Italian, Spanish, and Swedish.

Features

- *Document Handling*—Users can create, open, delete, move, copy, rename, and print documents, and retrieve them from the wastebasket via icons. Users can display information about each document, such as the creation date, date last modified, owner, and the full DOS pathname.
- *Powerful Search Facility*—Users can search for documents and compartments by specifying content, name, description, owner, or creation date. The user can search any or all filing levels within Vivace. All items found in a search are immediately available for editing. Users can conduct searches in several steps, narrowing the results at each step. A long search can be interrupted to inspect the result (to the point of interruption); the user then can continue the search or start editing the document.
- *Naming Convention*—Users can assign meaningful names (up to 24 characters) to documents, filing compartments, and services. Documents and filing compartments can have an additional 60-character description for further identification.
- *Document Filing*—Vivace stores all documents in archives. The system automatically sets up one archive for each user; however, each user can choose to maintain up to 30 archives. Users also can set up the number of storage levels they want to use, up to a maximum of six.
  Users can file documents at any level in an archive. A user can retrieve a filed document, read or edit it on the desktop, and then ask the system to file it automatically in its original location. Related documents can be filed together, regardless of the types of applications used to create them.
  Most of the document-handling functions are available in the archives; the user does not have to put the document on the desktop first.
  Users can create, open, copy, rename, and delete filing compartments such as drawers and folders, just as for documents. When the user moves, copies, or deletes a filing compartment, or retrieves it from the wastebasket, all of the compartment's contents move with it.
- *Customizable Document Backup*—Whenever the user deletes a document, Vivace places a copy in the wastebasket. The user can predetermine the number of calendar days items are to be kept in the wastebasket. When this holding period has expired, the user can choose whether the item should be deleted or retained as backup.
- *Import of Existing DOS Files*—DOS files not filed under Vivace are displayed as DOS files on the Vivace desktop and in the archives. The user can convert these files into Vivace documents by importing them. Importing a document involves associating it with one of the editors set up in Vivace, choosing an icon for it, and giving it a Vivace name and description.
- *Sharing Resources in a Network*—Vivace users whose PCs are connected to a LAN can share the use of resources and networked applications, and can access shared archives. All access rights set up for the network remain in force.
- *Context-Sensitive Help*—At any time, the user can display "help" information about the current situation or action. Furthermore, the help facility tracks the user's actions: As the user opens windows and menus, or selects items or menu entries, the help information changes accordingly. Users can open, close, move, or size the help window just like any other window.
- *Open and Extendable Environment*—Users can specify third-party applications to be used as document editors, as services on the desktop, or as entries in the tools menu. For example, the user simply browses for the command (.exe, .bat, etc.) that starts the application. Users can represent services with icons, from a set of 32 icons.
- *Simple Integration of Applications*—Vivace handles documents created by many types of Windows and non-Windows applications. Out of the box, Vivace recognizes and automatically integrates 40 popular PC applications. Additional applications can be integrated through a simple scripting capability. By means of default document icons, start-up commands, and templates, Vivace provides for automatic integration with those applications present on the system. This integration works with the following popular applications:

cc:Mail for Windows	Corel DRAW
DaVinci for Windows	DisplayWrite
DrawPerfect	Framework III
DECwrite for Windows	Friendly FAX
Harvard Graphics	Harvard Project Manager
Hollywood	Legacy for Windows
Lotus 1-2-3	Lotus Ami Pro
Lotus Freelance Graphics	Lotus Symphony
Microsoft Cardfile	Microsoft Excel
Microsoft Mail for Windows	Microsoft Multiplan
Microsoft Notepad	Microsoft Paintbrush
Microsoft PowerPoint	Microsoft Word
Microsoft Word for Windows	Microsoft Write
PageMaker	PageMaker Table Editor
Persuasion	PlanPerfect
Project Manager Workbench	Quattro Pro
RapidFile	Signature
Storyboard	SuperBase4
SuperCalc5	Upword
Ventura Publisher	WingZ
WordPerfect	WordStar

(Continued)

Vivace for Windows Version *(Continued)*

- *Easy Installation and Maintenance*—Vivace offers one easy-to-use interface for daily work and for activities such as installation and integration of document editors, services, and tools.

Hardware Requirements:

Vivace will run on any Intel 80286-, 80386-, or 80486-based personal computer that includes 1 Mbyte of extended memory (2 Mbytes recommended), a 40-Mbyte hard disk or network disk with 1.5-Mbyte of free space, a 720-Kbyte diskette drive, and a mouse or other Windows pointing device. In a PC LAN, at least one base system must have a 720-Kbyte diskette drive; in an asynchronous network environment, every base system must have one 720-Kbyte diskette drive and 1.5-Mbyte of free hard-disk space.

Software Requirements:

Vivace requires MS-DOS Version 3.3, 4.0, 4.1, or 5.0; and Microsoft Windows Version 3.0 or 3.1.

Vivace works with Novell NetWare, Microsoft LAN Manager, Banyan VINES, and Digital PATHWORKS.

Media and Documentation

QB-MQGAA-SA	Vivace for Windows (shrink wrapped kit) includes media and documentation

PATHWORKS Packaged Servers Comparison Chart

Now users can easily combine the power of their standalone PCs with the resources, security, and manageability of a local server system. Digital offers three PATHWORKS server packages to help create a client/server network to fit any group. These packages have everything needed, including software, hardware, and documentation.

	PATHWORKS Server 333	PATHWORKS Server 433	PATHWORKS Server 3100
CPU	Intel 80386	Intel 80486	VAX (CMOS)
Clock speed/performance	33 MHz	33 MHz	Models 30 and 40: 25 MHz Model 80: 50 MHz Model 90: 72 MHz
Standard memory	8 Mbytes	12 Mbytes	8 Mbytes
Maximum memory	16 Mbytes	64 Mbytes	Models 30 and 40: 32 MB Model 80: 72 MB Model 90: 128 MB
Storage interface	SCSI, IDE	SCSI, EISA	SCSI
Standard hard disk storage	170 Mbytes	640 Mbytes	209 Mbytes
Maximum hard disk storage	340 Mbytes	4.4 Gbytes	8.7 Gbytes
Diskette storage	1.44 Mbytes optional	1.44 Mbytes standard	1.44 Mbytes optional
Tape support	150 Mbytes[2]	150 Mbytes	95 Mbytes
CD-ROM support	—	600 Mbytes	600 Mbytes (Not on Model 30)
Console included	Color VGA graphics	Monochrome character cell	Monochrome character cell
PC Client operating systems	DOS, OS/2	DOS, OS/2	DOS, OS/2[3] Macintosh [3]
Network connectors	BNC standard AUI optional	BNC standard AUI standard	BNC standard AUI standard
Software and documentation included	PATHWORKS for OS/2 Server software and server license; PATHWORKS for OS/2 Client software;[4] OS/2 SE V1.21 operating system	PATHWORKS for OS/2 Server software and server license; PATHWORKS for OS/2 Client software;[4] OS/2 SE V1.21 operating system	PATHWORKS for VMS; PATHWORKS for DOS; VMS V5.5
Menu interface	Yes	Yes	Yes
Client licenses included	No	No	No
User installable	Yes	Yes	Yes
Wide area network package available	Yes[5]	Yes[5]	Yes
Recommended use	Dedicated or non-dedicated server; low-cost Intel server; small- to medium-sized office	Dedicated or non-dedicated server	Dedicated or non-dedicated server; 70+ simultaneous client PCs[6]; local- or wide-area networking

[1] VAX Unit of Performance
[2] The PATHWORKS Server 333 offers the option of adding a second 150-Mbyte streaming tape, available separately.
[3] With the addition of optional software loaded on the server.
[4] Client license(s) must be ordered separately.
[5] When used in conjunction with a VMS or ULTRIX server.
[6] Actual number is application dependent.

PATHWORKS Server 333

The PATHWORKS Server 333 is recommended for small work groups of PC users needing to share file, print, and resource services. This low-priced, Intel-based solution is ideal when local area networking is the primary application. Providing PATHWORKS services and full support for LAN Manager V2.0 networking systems, this solution is particularly appealing for entry-level PC LANs.

A DECstation 333c system, this 33-MHz 80386-based server supports the High-Performance File System (HPFS) and is fully compatible with Digital networks and PATHWORKS installations.

Step 1—Packaged System

- Packaged PATHWORKS Server 333 is a complete 120-V system and includes U.S. keyboard and all required power cords. To order a non-U.S. system, see DECstation 333c order menu.
- Options ordered from this menu will be shipped separately for customer installation.
- Packaged system includes a server license. If server is to function as both a server and a client, order client license.
- A client license must be purchased for each additional client PC.

PATHWORKS Server 333 includes

- PATHWORKS for OS/2 server license, software media and documentation
- OS/2 Standard Edition V1.21 operating system
- 8 Mbytes of memory, expandable to 16 Mbytes
- 32-Kbyte cache memory
- 101-key industry-standard keyboard
- Two-button serial mouse
- 14-inch VGA color monitor
- SCSI/IDE controllers
- 170-Mbyte SCSI hard disk
- DEC EtherWORKS Ethernet network interface card

Order Number	Memory	Monitor	Internal Storage
DJ-PC4S3-AB	8 Mbytes	14-inch color	1 × 170-Mbyte SCSI disk

Step 2—Storage

Select additional storage if required.

- System supports a maximum of three internal drives (one removable device; diskette or tape) and two SCSI or IDE hard drives or two removable devices and one hard drive.
- System includes SCSI and IDE controllers.

Step 2a—Internal Storage

Select a removable media device if required. 60-Mbyte tape drive uses diskette drive interface.

PC4XR-GA	360-Kbyte 5.25-inch diskette drive
PC4XR-EA	1.2-Mbyte 5.25-inch diskette drive
PC4XR-FA	1.44-Mbyte 3.50-inch diskette drive
PC4XT-CA	60-Mbyte tape drive
PC4XT-DA	60-Mbyte tape cartridge for (PC4XT-CA)

System includes one 170-Mbyte SCSI hard disk drive.

IDE Drives:

PC4XR-BD	52-Mbyte 3.5-inch hard disk drive
PC4XR-EB	105-Mbyte 3.5-inch hard disk drive
PC4XR-DB	120-Mbyte 3.5-inch hard disk drive

Step 2a—Internal Storage *(Continued)*

SCSI Drives:

PC4XR-CA	80-Mbyte 3.5-inch hard disk drive
PCXAR-AA	209-Mbyte 3.5-inch hard disk drive
PC4XR-HA	320-Mbyte 5.25-inch hard disk drive
PCXAR-AB	426-Mbyte 3.5-inch hard disk drive
PC4XT-AA	150-Mbyte SCSI tape drive for DOS
PC4XT-BA	150-Mbyte tape cartridge for (PC4XT-AA)

Step 3—Memory

- System includes 8 Mbytes of memory.
- System supports a maximum of 16 Mbytes of memory.
- Memory expansion adapter is required when expanding to greater than 10 Mbytes.

PC46M-AA	Memory expansion adapter

For a total memory of:	Order this quantity:	of this Order Number:
1 Mbyte	2	**PC4XM-CA**
4 Mbytes	2	**PC4XM-CB**
8 Mbytes	4	
12 Mbytes	6	
16 Mbytes	8	

Step 4—Client Licenses

Client license

- Required if server is to function as both server and client
- Required for each additional client PC

QL-YFWAW-AA	PATHWORKS for OS/2 client license
QL-0TLA9-AA	PATHWORKS for DOS client license

Step 5—Math Coprocessor

PCXAP-CD	Intel 80387 math coprocessor

Step 6—Documentation

PC46Y-CC	User documentation set (multilingual versions)
PC46Y-DD	Technical reference manual (English language only)

PATHWORKS Server 433

The PATHWORKS Server 433 is based on a DECpc 433T system, an Intel 80486-based 33-MHz microprocessor using EISA bus architecture. This server is recommended for workgroups of PC users needing to share file, print, and resource services. The PATHWORKS Server 433 provides PATHWORKS services and full support for the LAN Manager V2.0 network operating system and is particularly appealing for workgroup PC LANs.

This server supports the High-Performance File System (HPFS) of OS/2 V1.21 and is fully compatible with Digital networks and PATHWORKS installations.

Step 1—Packaged System

- Packaged PATHWORKS Server 433 is a complete 120-V system and includes a U.S. keyboard and all required power cords. To order a non-U.S. system, see order menu for DECpc 433T.
- Options ordered from this menu will be shipped separately for customer installation.
- Packaged system includes a server license. If server is to function as both a server and a client, order client license.
- A client license must be purchased for each client PC.

PATHWORKS Server 433 includes

- PATHWORKS for OS/2 server license, software media, and documentation
- OS/2 Standard Edition V1.21 operating system
- 12 Mbytes of memory, expandable to 64 Mbytes
- 128 Kbytes cache memory, expandable to 256 Kbytes
- 101-key industry-standard keyboard
- Two-button serial mouse
- Video controller
- 14-inch monochrome monitor
- EISA/SCSI controller
- One 3.5-inch 1.44 diskette drive
- Two 320-Mbyte SCSI disk drives
- DEC EtherWORKS network interface

Order Number	Memory	Monitor	Internal Storage
DJ-PCTS1-AA	12 Mbytes	14-inch monochrome	2 × 320 Mbytes SCSI disks 1 × 1.44 Mbytes diskette

Step 2—Storage

- System supports a maximum of ten drives (two diskettes and eight half-height drives) or (two diskettes and four full-height drives).
- System includes one 1.44-Mbyte diskette drive.
- Select one additional removable media device if required.

PC4XR-EA 1.2-Mbyte 5.25-inch diskette drive

- System includes two 320-Mbyte SCSI hard disk drives.
- Select additional devices if required:

PCXAR-AA 200-Mbyte half-height hard disk drive
PCXAR-AB 426-Mbyte half-height hard disk drive
PCXAT-AC 525-Mbyte half-height Quarter Inch Cartridge (QIC) for OS/2
PCXBR-AA 650-Mbyte 5.25-inch full-height hard disk drive
PCXBR-AB 1.0-Gbyte 5.25-inch full-height hard disk drive

Step 3—Memory

- System includes 12 Mbytes of memory (maximum 64 Mbytes).
- Select memory in quantities listed below.

For a total memory of:	Order this quantity:	of this Order Number:
4 Mbytes	0	**Included**
8 Mbytes	2	**PCXAM-DB**
12 Mbytes	4	
16 Mbytes	6	
20 Mbytes	2	**PCXAM-DC**
24 Mbytes	2	**PCXAM-DB**
	2	**PCXAM-DC**
28 Mbytes	4	**PCXAM-DB**
	2	**PCXAM-DC**
36 Mbytes	4	**PCXAM-DC**
40 Mbytes	2	**PCXAM-DB**
	4	**PCXAM-DC**
52 Mbytes	6	**PCXAM-DC**
64 Mbytes	8	**PCXAM-DC**

PCXAM-DB 2-Mbyte (2 × 1-Mbyte SIMMs)
PCXAM-DC 8-Mbyte (2 × 4-Mbyte SIMMs)

Note: To achieve 64 Mbytes, 4 Mbytes (PCXAM-DB) included in packaged system, must be removed.

Step 4—Cache Memory

- System includes 128-Kbyte cache.
- Select an additional cache memory upgrade, if required.

PCT1M-AA 128-Kbyte cache expansion upgrade

Step 5—Client Licenses

Client license

- Required if server is to function as both server and client
- Required for each additional client PC

QL-YFWAW-AA PATHWORKS for OS/2 client license
QL-0TLA9-AA PATHWORKS for DOS client license

Step 6—Math Coprocessor

PCXAP-DB Math coprocessor (Weitek 4167, 33 MHz)

Step 7—Ethernet Controller

- System includes DEC EtherWORKS network interface.
- Select Ethernet controller cards, if required.
- Cables are not included; order BNC, twisted pair, and AUI cables separately.

DE100-AA EtherWORKS LC Ethernet adapter
DE101-AA EtherWORKS LC/TP Ethernet adapter
DE200-AC EtherWORKS Turbo Ethernet adapter (included in packaged server)
DE201-AC EtherWORKS Turbo/TP Ethernet adapter

Step 8—Documentation

PCT1Y-AA Technical reference manual (English language only)

PATHWORKS Server 3100

The MicroVAX 3100 PATHWORKS systems provide the means to get greater productivity from desktop systems by connecting PC clients based on MS-DOS, OS/2, UNIX, and Macintosh. Digital's advanced client/server computing, based on NAS (Network Application Support) delivers a wide range of solutions to help integrate all the different desktop workstations and PCs within an organization. Digital's preconfigured MicroVAX 3100 PATHWORKS systems provide the first, simple step to an integrated enterprise by providing MS-DOS and VAX connectivity packages.

Step 1—Packaged Systems

PATHWORKS packages include

- Small enclosure with CPU/FPU (Model 30) or large enclosure with CPU/FPU (Models 40, 80 and 90)
- Memory—parity (Models 30 40 and 80), ECC (Model 90)
- 802.3/Ethernet interface (ThinWire/thick wire) with terminators
- Ethernet kit; includes ThinWire T-connector with BNC terminators and 15-pin thick wire terminator
- Synchronous SCSI interface for connecting internal and external SCSI devices; external connection via a 50-pin external SCSI connector
- Three DEC-423 asynchronous serial lines (MMJ data leads only)
- EIA-232 asynchronous serial line with modem control (25-pin D-subminiature connector)
- H8575-a 25-pin-to-MMJ DEC-423 to EIA-232 adapter
- External SCSI terminator
- 7.6-meter (25-foot) console terminal cable
- 120-V power cord (country-specific power cord required for 240-V systems)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- Hardware documentation: Model 30 QZ-K44AA-GZ; Models 40, 80, 90 QZ-K44AB-GZ
- Software licenses: OpenVMS 2-user license (with Rdb/VMS runtime license) and DECnet end-node license with PATHWORKS for VMS
- Media: PATHWORKS for MS-DOS media on TK50 (QA-0TLAA-H5) and PATHWORKS for VMS on TK50 (QA-A93AA-H5)

Order Number	PATHWORKS Server	Memory	Internal Storage RZ25 = 426 MB; RZ26 = 1.0 GB; TZ30 = 95 MB
DJ-31FP1-A9	MicroVAX 3100 Model 30	16 MB	RZ25 + TZ30
DJ-31GP1-A9	MicroVAX 3100 Model 40	16 MB	RZ25 + TZ30
DJ-31HP1-A9	MicroVAX 3100 Model 80	16 MB	RZ25 + TZ30
DJ-31PP1-C9	MicroVAX 3100 Model 90	16 MB	RZ26 + TZ30
DJ-31PP1-E9	MicroVAX 3100 Model 90	64 MB	RZ26 + TZ30

Step 2—Storage

Configuration Rules

Model 30 supports:

- Maximum three half-height internal devices: one 5.25-inch removable media (diskette or tape) and two RZxx hard disk drives
- Maximum two fully populated SZ12 dual-drive expansion boxes (four devices)
- Maximum two tape devices, one internal plus one external, or two external

Models 40, 80, 90 support:

- Maximum five half-height internal devices: two removable media (two TZK10 QIC tapes, two RX26 diskette, or one RRD42 compact disc (left cavity only) plus one TZ30 tape (right cavity only) and three RZxx hard disk drives.

Note: Internal RRD42 compact disc drive not supported in Model 30 systems

Step 2—Storage *(Continued)*

Field-installed options require Customer Services installation.

Factory/Field Installed

RZ23L-EJ/EH	121-Mbyte 3.5-inch half-height embedded SCSI fixed disk drive
RZ24L-EJ/EH	245-Mbyte 3.5-inch half-height embedded SCSI fixed disk drive
RZ25-EN/EK	426-Mbyte 3.5-inch half-height embedded SCSI fixed disk drive
RZ26-EN/EK	1.0-Gbyte 3.5-inch half-height embedded SCSI fixed disk drive
RX26-EN/EL	2.8-Mbyte 3.5-inch diskette drive
TLZ06-HF/HG	4.0-Gbyte 4-mm 3.5-inch half-height embedded SCSI digital audio tape (DAT) drive
TZ30-EK/EL	95-Mbyte 3.5-inch steaming tape drive
TZK10-HF/HG	320/525-Mbyte quarter-inch cartridge (QIC) tape drive
RRD42-EN/EK	600-Mbyte compact disc drive (Models 4, 80, 90 only)

Step 3—Memory

Configuration Rules

Models 30 and 40:	Include 8 Mbytes of memory embedded on CPU, additional 8 Mbytes of parity memory in two memory slots; six slots total. Maximum memory 32 Mbytes.
Model 80:	Includes 16 Mbytes of parity memory in four memory slots; six slots total. Maximum memory 72 Mbytes
Model 90:	Includes 16 or 64 Mbytes of ECC memory in four memory slots, eight slots total. Maximum memory 128 Mbytes

Digital Single In-Line Memory (DSIM)

MS44L-BA	8-Mbyte parity (2 × 4-Mbyte 100-ns DSIM), Model 30, 40, 80 systems
MS44-DA	32-Mbyte parity (2 × 16-Mbyte 100-ns DSIM), Model 80
MS44L-BC	16-Mbyte ECC (4 × 4-Mbyte 100-ns DSIM), Model 90
MS44-DC	64-Mbyte ECC (4 × 16-Mbyte 100-ns DSIM), Model 90

Note: ECC memory for Model 90 must be installed in sets of four

For more information on options available for MicroVAX 3100 Systems and Servers, see Chapter 1, *VAX Systems*, page 1.27.

Note: Digital offers both Ethernet and Token Ring network interface cards.

EtherWORKS Network Interface Cards

The EtherWORKS family of network interface cards gives personal computers access to Ethernet networks and enables PCs to access the file, disk, application, print, and network services of the PATHWORKS network personal computing products.

Software drivers included with all EtherWORKS products have been certified by Novell and Microsoft Corporation for compatibility with NetWare V2.15 DOS Client and NDIS V1.0.

Features

- Offers complete line of 8-, 16-, and 32-bit network interface cards for ThinWire, thick wire, and unshielded twisted pair (10BaseT) Ethernet
- Supports multivendor PC LAN software
- Supports PATHWORKS PC networks
- Provides high performance and increased productivity for networked PCs
- Connects PCs using Ethernet V2.0, 802.3/Ethernet, and 10BaseT standards
- Requires only one PC slot
- Supports remote boot capability for PATHWORKS and NetWare
- Provides compatibility through built-in configurators
- Allows flexible network topologies for a wide range of networking options
- Provides multiple transmit and receive buffers and multicase address filtering to ensure performance during heavy network traffic times

The seven members of the EtherWORKS family are:

- EtherWORKS LC (DE100)
- EtherWORKS LC/TP (DE101)
- EtherWORKS Turbo (DE200)
- EtherWORKS Turbo/TP (DE201)
- EtherWORKS Turbo TP/BNC (DE202)
- EtherWORKS MicroChannel (DE210)
- EtherWORKS MicroChannel/TP (DE212)
- EtherWORKS EISA TP/BNC (DE422)

EtherWORKS Comparison Chart

Wiring Media	PC BUS (See PC manual for bus type)		
	ISA/EISA (for PC, PC/XT, and PC/AT)	**MicroChannel (for PS/2)**	**EISA**
Twisted Pair (RJ45) Unshielded or Shielded	EtherWORKS LC/TP • Low cost • 8-bit • Also thick wire • Order DE101 EtherWORKS Turbo/TP • High performance • 16-bit • Also thick wire • Order DE201 EtherWORKS Turbo TC/BNC • High performance • 16-bit • Also ThinWire • Order DE202	EtherWORKS MC/TP • High performance • 16-bit • Also ThinWire • Order DE212	EtherWORKS EISA TP/BNC • High performance • 32-bit • Also ThinWire • Order DE422
ThinWire (BNC)	EtherWORKS LC • Low cost • 8-bit • Also thick wire • Order DE100 EtherWORKS Turbo • High performance • 16-bit • Also thick wire • Order DE200 EtherWORKS Turbo TP/BNC • High performance • 16-bit • Also twisted pair • Order DE202	EtherWORKS MC • High performance • 16-bit • Also thick wire • Order DE210 EtherWORKS MC/TP • High performance • 16-bit • Also twisted pair • Order DE212	EtherWORKS EISA TP/BNC • High performance • 32-bit • Also twisted pair • Order DE422
Thick Wire (AUI)	EtherWORKS LC • Low cost • 8-bit • Also ThinWire • Order DE100 EtherWORKS LC/TP • Low cost • 8-bit • Also twisted pair • Order DE101 EtherWORKS Turbo • High performance • 16-bit • Also ThinWire • Order DE200 EtherWORKS Turbo TP • High performance • 16-bit • Also twisted pair • Order DE201	EtherWORKS MC • High performance • 16-bit • Also ThinWire • Order DE210	

DEC EtherWORKS NIC Family Overview

	LC	LC/TP	Turbo	Turbo/TP	Turbo TP/BNC	MC	MC/TP	EISA TP/BNC
Bus Architecture	XT, AT, EISA	XT, AT, EISA	AT, EISA	AT, EISA	AT, EISA	MCA	MCA	EISA
Standard Ethernet Connection	BNC & AUI	RJ45 UTP/STP & AUI	BNC & AUI	RJ45 UTP/STP & AUI	RJ45 UTP/STP & BNC	BNC & AUI	RJ45 UTP/STP & BNC	RJ45 UTP/STP & BNC
Order No.	DE100	DE101	DE200	DE201	DE202	DE210	DE212	DE422
Data Path	8-bit	8-bit	16-bit	16-bit	16-bit	16-bit	16-bit	32-bit
Slot Size	Half	Half	Half	Half	Half	Full	Full	Full
LSI Controller Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethernet V2.0 Support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IEEE 802.3 Support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NDIS	Yes, V2.0	Yes, V2.0	Yes, V2.0	Yes, V2.0	Yes, V2.0	Yes, V2.0	Yes, V2.0	Yes, V2.0
NetWare, ODI	Yes, V3.11 server and client	Yes, V3.11 server and client	Yes, V3.11 server and client	Yes, V3.11 server and client	Yes, V3.11 server and client	Yes, V3.11 server and client	Yes, V3.11 server and client	Yes, V3.11 server and client
NetWare, IPX	Yes, V2.2 server and client	Yes, V2.2 server and client	Yes, V2.2 server and client	Yes, V2.2 server and client	Yes, V2.2 server and client	Yes, V2.2 server and client	Yes, V2.2 server and client	Yes, V2.2 server and client
SCO UNIX System V/386	Yes, Release 3.2	Yes, Release 3.2	Yes, Release 3.2	Yes, Release 3.2	Yes, Release 3.2	Yes, Release 3.2	Yes, Release 3.2	Yes, Release 3.2
Buffer Memory (RAM)	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	64 KB	128 KB
PC System Memory	2, 32, or 64 KB	2, 32, or 64 KB	32 or 64 KB	32 or 64 KB	32 or 64 KB	16, 32, or 64 KB	16, 32, or 64 KB	16, 32, or 64 KB
Firmware (ROM)	16 KB	16 KB	16 KB	16 KB	16 KB	16 KB	16 KB	16 KB
Remote Boot Capability	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PATHWORKS, NetWare, Others	Included Optional	Included Optional	Included Optional	Included Optional	Included Optional	Included Optional	Included Optional	Included Optional
FCC Certified	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B
VDE Certified	Class B	Class B	Class B	Class B	Class B	Class B	Class B	Class B
User Manual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Warranty	One Year	One Year	One Year	One Year	One Year	One Year	One Year	One Year
User Installable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

DEC EtherWORKS LC	**DE100-AA***	Low-cost Ethernet card with terminator and T-connector
DEC EtherWORKS LC/TP	**DE101-AA***	Unshielded twisted-pair Ethernet card
DEC EtherWORKS Turbo	**DE200-AC***	High-performance Ethernet card with terminator and T-connector
DEC EtherWORKS Turbo/TP	**DE201-AC***	Unshielded twisted-pair Ethernet card
DEC EtherWORKS Turbo TP/BNC	**DE202-AA***	High-performance twisted-pair (RJ45) or ThinWire (BNC) Ethernet card
DEC EtherWORKS MC	**DE210-AA***	MicroChannel Ethernet card with terminator and T-connector
DEC EtherWORKS MC/TP	**DE212-AA***	High-performance MicroChannel Ethernet card with BNC terminator and T-connector

***Notes:**

1. Cables are not included. Order BNC, twisted pair, and AUI cables separately.
2. PATHWORKS software for DOS and for OS/2 must be ordered as separate line items.
3. EtherWORKS Ethernet network interface cards do not offer support for the Digital mouse. In the PATHWORKS environment, EtherWORKS should be used only with 100 percent Microsoft-compatible mice.

Optional Hardware

DESPR-EE	ThinWire Ethernet single-port repeater; connects one ThinWire segment with up to 29 daisychained PCs to an Ethernet backbone.
DEMPR-AA	ThinWire Ethernet multiport repeater; provides ports to connect eight ThinWire segments and a port for connecting to standard baseline cable.

Token Ring Cards

ProNet Family

The ProNET 4/16 family of high-performance Token Ring network interface cards provides a physical connection between a PC and the network.

Features

- Connects PCs using IEEE 802.5/Token Ring standards for 4/16 Mb/s Token Ring networking applications
- Supports Extended Industry Standard Architecture (EISA), MicroChannel, and IBM PC/AT bus architecture
- Supported by PATHWORKS for DOS, PATHWORKS for OS/2, and PATHWORKS for DOS (NetWare Coexistence) software as well as many other network operating systems
- Offers media flexibility with onboard support for shielded twisted-pair (STP), unshielded twisted-pair (UTP), and fiber optic cabling media

Ordering Information

DW110-AA	ProNET-4/16 AT network interface card provides an interface between a 4-Mbit/s or 16-Mbit/s 802.5/Token Ring network on IBM PCs, PC/ATs, and ISA compatibles.
DW210-AA	ProNET-4/16 MicroChannel interface card provides an interface between a 4-Mbit/s or 16-Mbit/s 802.5/Token Ring network, IBM PS/2, and MicroChannel-compatible PCs.
DW300-AA	ProNET-4/16 EISA network interface card provides an interface between the 4-Mbit/s or 16-Mbit/s 802.5/Token Ring network and the EISA network compatible PCs.

ProNet Family *(Continued)*

H7014-AA	ProNET-4/16 Unshielded Twisted Pair (UTP) Media Filter enables connectivity between a 100-ohm Unshielded Twisted Pair and older versions of IBM's 16/4 Adapter (ISA) and 16/4 Adapter/A (MCA) on the ProNET-4/16 (MCA) 150-ohm network interface cards.
H7015-AA	ProNET-4/16 Unshielded Twisted Pair (UTP) Media Filter enables connectivity between a 100-ohm Unshielded Twisted Pair cable and IBM's new versions of the 16/4 adapter (ISA) and the 16/4M Adapter/A (MCA) 150-ohm network interface cards.

DEC TRNcontroller 100

The DEC TRNcontroller 100 and the Digital Token Ring Network Device Driver are a Q-bus controller and a software driver that enable MicroVAX/VAXserver 3xxx (except the 3100) and VAX/VAXserver 4000 systems to connect to a 4-Mbit/s or 16-Mbit/s 802.5/Token Ring network.

Features

- Digital Token Ring Network Device Driver (TRDRV V/V V1.1 for VMS
- Supports DECnet VAX
- Includes self-test diagnostics and VMS installation verification procedure kit
- Serial console port can support a console device for debugging purposes (BC29E-15)
- Supports STP connections only
- Microcode-based device
- Supported in BA200 and BA400 series enclosures (MicroVAX VAXserver 3xxx [except 3100], VAX 4000 systems)
- Includes hardware and software documentation
- Source routing as a DECnet datalink service
- Arbitrary Macintosh layer addressing

Hardware Requirements

VAX configuration

Software Requirements

VMS V5.5 operating system

Optional Networking Software

- DECnet VAX IV
- PATHWORKS for VMS 4.1-1

DEQRA-CA	DEC TRNcontroller 100

EtherWORKS Router/DECnet

The EtherWORKS Router/DECnet V1.0 addresses the DECnet connectivity needs of small PC local area networks (LANs) in remote branch office locations usually found in retail, banking, service, and insurance businesses.

EtherWORKS Router/DECnet connects PC LANs to a DECnet wide-area network. Users can communicate with other users on DECnet nodes over asynchronous or synchronous connections that support the Digital Data Communications Message Protocol (DDCMP). The DDCMP ensures integrity and correct sequencing of messages between adjacent nodes.

The result is full access to a robust, wide-area network for file and print services and for client/server applications such as mail, conferencing, and browsing. In addition, file and print services will work transparently over the WAN on other servers.

The user can downline load the router software from any PC system running DOS and PATHWORKS for DOS software on the same Ethernet segment with the EtherWORKS Router. This includes the same PC system housing the EtherWORKS Router card as long as that PC has an additional Ethernet interface card.

EtherWORKS Router/DECnet *(Continued)*

Features

- Provides cost-effective routing for branch offices within a DECnet area as well as between DECnet areas
- Combines PC-card hardware and routing software to run on personal computers with no performance impact
- Offers expandable memory (from 0.5 to 3.5 Mbytes) to protect investments through future software upgrades
- Uses asynchronous and synchronous connections, allowing users to choose low-cost services
- Selects the least-cost path and reroutes traffic if there is a line failure in the DECnet network
- Supports up to 2 × 64 Kbits/s, providing full backup-line and growth capabilities plus the opportunity to move from low- to high-speed connections
- Features easy-to-use DOS-based installation and single-box packaging

Hardware Requirements

Note: The hardware and software can be configured on the same system if there is a separate connection to Ethernet in addition to the EtherWORKS Router connection.

- Any PC/AT-compatible personal computer to run the router software and hardware
- A minimum of one drive (3.5-inch 720-Kbyte or 5.25-inch 360-Kbyte) for software installation
- Optional adapter cables for high-speed ports

Software Requirements

Valid configuration of the DOS operating system and PATHWORKS for DOS networking software

Disk Space Requirements

For local host PC:

- 1250 blocks (640 Kbytes) for installation
- 530 permanent blocks (270 Kbytes) per router for use

Optional Hardware

Modem (Digital's DF03, DF112, or DF224; Hayes SmartModem 2400, Codex 2233/2260)

A separate license is required for each EtherWORKS Router/DECnet hardware unit on which the EtherWORKS Router/DECnet software product will be used.

DE206-AA	EtherWORKS Router/DECnet includes the hardware module, software media, documentation, software license and associated cables.

DECpc Personal Computers

Overview

Wherever users are and whatever their applications, Digital has a personal computer to meet their needs. Digital's DECpc family of personal computers is perfect for network personal computing or for standalone operation. The family includes four types of personal computers, one to fit every need.

- High-performance networked graphics PCs
- On-the-go portables
- Highly expandable deskside PCs, ideal as PATHWORKS or NetWare PC LAN servers
- General-purpose desktop personal computers based on Intel 80386 and 80486 microprocessors

Based on popular Intel 80386, 80386sx, 80486, and 80486sx microprocessors, DECpc computers are industry-standard personal computers. Whichever DECpc system users select, they can choose the operating system that's right for them—DOS with its rich set of proven applications or OS/2 with its flexibility to meet the increasing performance needs of the future. SCO UNIX is also available for high-end PCs and multiprocessor systems.

The DECpc family participates fully in leading network environments. With these PCs, users can use all of their favorite applications and still have access to group, departmental, and corporate resources through local area network software such as the PATHWORKS products from Digital.

Users can order their DECpc personal computers as packaged systems or *A-La-Carte* systems, allowing them to create a customized system to meet their specific needs.

The following chart helps determine which DECpc personal computer is right for the user. Each offers the superior quality users expect from Digital and the dedicated customer support that makes it easy to get—and stay—up and running. The following pages describe each member of the family in greater detail.

DECpc Personal Computers Comparison Chart

	Portable Systems	Entry-Level Desktops			Mid-Range Desktops		
Features	**DECpc 320P Notebook**	**DECpc 316sx**	**DECstation 320sx**	**DECpc 420sx**	**DECstation 325c**	**DECstation 333c**	**DECstation 425c**
Industry standard	PC/XT, PC/AT	PC/XT, PC/AT	PC/XT, PC/AT	PC/XT, PC/AT	PC/XT, PC/AT	PC/XT, PC/AT	PC/XT, PC/AT
Processor (Intel)	80386sx	80386sx	80386sx	80486sx	80386	80386	80486
Clock Speed	20 MHz	16 MHz	20 MHz	20 MHz	25 MHz	33 MHz	25 MHz
System Box Dimensions	10" × 12.2" W × 1.7" D	4.25" × 15.5" W × 15" D	4.25" × 15.5" W × 15" D	4.25" × 15.5" W × 15" D	6.25" × 17" W × 16" D	6.25" × 17" W × 16" D	6.25" × 17" W × 16" D
3.5-in/1.44-MB Diskette Drive	Included	Included	Included	Included	Included	Included	Included
Memory							
Minimum	2 Mbytes	1 Mbyte	1 Mbyte	4 Mbytes	1 Mbyte	1 Mbyte	1 Mbyte
Maximum	8 Mbytes	13 Mbytes [4]	13 Mbytes [4]	32 Mbytes	16 Mbytes	16 Mbytes	16 Mbytes
Memory Expansion Adaptor		Option	Option		Included	Included	Included
Cache Memory				8 KB	32 KB	32 KB	8 KB
Power Supply	3-hour battery; AC adapter	100 Watts	100 Watts	100 Watts	200 Watts	200 Watts	200 Watts
Options Slots		3 PC/AT	3 PC/AT	3 PC/AT	6 PC/AT	6 PC/AT	6 PC/AT
32-bit Proprietary Memory Slots					2	2	2
Video Controller	Included	Included	Included	Included	Option	Option	Option
Math Coprocessor	Option	Option	Option		Option	Option	Option
IDE Adapter	Included	Included	Included	Included	Included	Included	Included
IDE Drive Support	2.5" 40-MB or 80-MB drive	Option: 3.5": 52, 105, 120, 240 MB drive	Option: 3.5": 52, 105, 120, 240 MB drive	Option: 3.5": 52, 105, 120, 240 MB drive	Option: 3.5": 52, 105, 120, 240 MB drive	Option: 3.5": 52, 105, 120, 240 MB drive	Option: 3.5": 52, 105, 120, 240 MB drive
SCSI Adapter		Option	Option	Option	Option	Option	Option
SCSI Drive Support		Option:	Option:	Option:	Option:	Option:	Option:
3.5-inch hard disk		245 & 426 MB	245 & 426 MB	245 & 426 MB	245 & 426 MB	245 & 426 MB	245 & 426 MB
5.25-inch hard disk		320 MB	320 MB		320 MB	320 MB	320 MB
5.25-inch tape drive					150, 525 MB	150, 525 MB	150, 525 MB
CD-ROM							
Ports	Parallel, serial, VGA, keyboard	Parallel, serial, mouse, VGA, keyboard	Parallel, serial, mouse, VGA, keyboard	Parallel, serial, mouse, VGA, keyboard	Parallel, serial, mouse, keyboard	Parallel, serial, mouse, keyboard	Parallel, serial, mouse, keyboard
Storage Bays[1]		One 3.5"; one 5.25"	One 3.5"; one 5.25"	One 3.5"; one 5.25"	One 3.5"; two 5.25"	One 3.5"; two 5.25"	One 3.5"; two 5.25"
Keyboard							
101-key PC-style	Option	Option	Option	Option	Option	Option	Option
Gold-key style		Option	Option	Option	Option	Option	Option
PS/2 style	84-key included						
Mouse		Option	Option	Option	Option	Option	Option
Communications Devices							
Ethernet card		Option	Option	Option	Option	Option	Option
Token Ring card							
2400 baud internal modem	Included[2]	Option	Option	Option	Option	Option	
9600 baud fax/data modem	Included[2]						
Parallel/serial port adapter		Option	Option		Option	Option	Option
Operating System							
MS-DOS	Included[3]	Option	Option	Option	Option	Option	Option
OS/2		Option	Option	Option	Option	Option	Option
SCO UNIX					Option	Option	Option
Open Desktop					Option	Option	Option

1. Available storage bays.
2. Choice of 2400-baud internal modem or 9600-baud fax-data modem must be included in fully-configured system.
3. Includes MS-DOS V5.0 and Microsoft Windows V3.1
4. 5 MB maximum on the motherboard; PC/AT bus-based memory option.

DECpc Personal Computers Comparison Chart

	PC Workstation	Deskside Systems		
Features:	**DECpc 433 Workstation**	**DECpc 425ST**	**DECpc 433ST**	**DECpc 450ST**
Industry standard	PC/XT, PC/AT	EISA, PC/XT, PC/AT	EISA, PC/XT, PC/AT	EISA, PC/XT, PC/AT
Processor (Intel)	80486	80486	80486	80486
Clock Speed	33 MHz	25 MHz	33 MHz	50 MHz
System Box Dimensions	2.75" × 14.5" W × 16.5" D	18.5" × 7" W × 18.3" D	18.5" × 7" W × 18.3" D	18.5" × 7" W × 18.3" D
3.5-in/1.44-MB Diskette Drive	Option	Included	Included	Included
Memory				
Minimum	8 Mbytes	4 Mbytes	4 Mbytes	4 Mbytes
Maximum	48 Mbytes	192 Mbytes	192 Mbytes	192 Mbytes
Memory Expansion Adaptor	Included			
Cache Memory	64 KB and 128 KB option	8 KB expandable to 64 or 128 KB	8 KB expandable to 64 or 128 KB	8 KB internal: 256 KB external
Power Supply	105 Watts	254 Watts	254 Watts	254 Watts
Options Slots		6 EISA	6 EISA	6 EISA
32-bit Proprietary Memory Slots				
Video Controller	Included	Option	Option	Option
Math Coprocessor				
IDE Adapter	Included	Included	Included	Included
IDE Drive Support	Option: 3.5": 52-MB and 105-MB drive; 2.5": 40-MB and 80-MB drive	Option: 3.5": 52-MB, 105-MB, 120-MB, 240-MB drive	Option: 3.5": 52-MB, 105-MB, 120-MB, 240-MB drive	Option: 3.5": 52-MB, 105-MB, 120-MB, 240-MB drive
SCSI Adapter	Included	Option	Option	Option
SCSI Drive Support	Option:	Option:	Option:	Option:
3.5-inch hard disk	245, 426, 852 MB	245, 426, 852 MB	245, 426, 852 MB	245, 426, 852 MB
5.25-inch hard disk	170 and 320 MB	650 MB, 1 GB	650 MB, 1 GB	650 MB, 1 GB
5.25-inch tape drive	525 MB	525 MB	525 MB	525 MB
CD-ROM	600 MB	600 MB	600 MB	600 MB
Ports	Parallel, serial, video, mouse, keyboard	Parallel, two serial, keyboard, mouse	Parallel, two serial, keyboard, mouse	Parallel, two serial, keyboard, mouse
Storage Bays[1]	Up to 8; two in base (3.5" and 2.5"); three per expansion box (max. 2 exp.), three 3.5" or one 3.5" and two 5.25"	Four available; three 5.25" front-panel accessible, half-height; one 3.25" hidden full-height		
Keyboard				
101-key PC-style	Included	Included	Included	Included
Gold-key style	Option	Option	Option	Option
PS/2 style	84-key included			
Mouse	Included	Included	Included	Included
Communications Devices				
Ethernet card	Included	Option	Option	Option
Token Ring card	Included			
2400 baud internal modem		Option	Option	Option
9600 baud fax/data modem				
Parallel/serial port adapter		Option	Option	Option
Operating System				
MS-DOS	Option	Option	Option	Option
OS/2	Option			
SCO UNIX		Option	Option	Option
Open Desktop	Option	Option	Option	Option

DECpc 320P Portable Computers

The newest addition to Digital's line of portable computers, the DECpc 320P, is a 6.4-pound 80386sx-based portable, for users whose jobs frequently take them away from their offices. Running at 20 MHz, this slim, entry-level machine offers 2 Mbytes of standard memory, expandable to 8 Mbytes, and a battery life of three hours.

With the DECpc 320P computer, users can stay in touch with their offices via modem or Ethernet connections. The portable computer features a 40- or 80-Mbyte internal hard disk drive, 3.5-inch 1.44-Mbyte internal diskette drive, backlit LCD VGA display, 84-key keyboard, and MS-DOS V5.0 operating system with Microsoft Windows V3.1.

The base system includes a modem; VGA, external serial/parallel ports; carrying case; and battery pack with an ac adapter. System does not support external expansion boxes. Fax/modem option must be selected at initial order; it may not be added later as an option. It also includes utilities and user documentation.

Step 1—Base System

Select system.

DECpc 320P Entry-Level Notebook includes:

- 2 Mbytes of memory expandable to 8 Mbytes
- 1.44-Mbyte 3.5-inch diskette drive
- 40-Mbyte or 80-Mbyte 2.5-inch hard drive
- 84-key keyboard
- LCD VGA display (640 × 480)
- Battery pack (3 hour)
- AC adapter
- 2400-baud data modem (see below)
- Serial/parallel ports: video and keyboard
- Serial mouse port
- Dedicated modem/fax option slot
- 120-V U.S. power cord
- Carrying case

PCP11-AA	Base system, 20-MHz, 40-Mbyte internal hard disk drive, 2400-baud data modem, carrying case, Logitech track ball, battery pack, ac adapter, 120-V power cord, QA Plus, MS-DOS V5.0 operating system with Microsoft Windows V3.1 installed. Add general-purpose options to meet user's needs.
PCP11-CA	Same as above with no modem, software, or power cord
PCP11-FA	Base system, 20-MHz, 80-Mbyte internal hard disk drive, 2400-baud data modem, carrying case, Logitech track ball, battery pack, ac adapter, 120-V power cord, QA Plus, MS-DOS V5.0 operating system with Microsoft Windows V3.1 installed. Add general-purpose options to meet user's needs.
PCP11-FZ	Same as above with no modem, software, or power cord
PCP11-IA	Base system, 20-MHz, 80-Mbyte internal hard disk drive, 9600-baud send/receive fax/2400-baud data modem, carrying case, Logitech track ball, battery pack, ac adapter, 120-V power cord, QA Plus, MS-DOS V5.0 operating system with Microsoft Windows V3.1 installed. Add general-purpose options to meet user's needs.

Step 2—Operating System

Select operating system if required.

QB-MESAA-SA	MS-DOS V5.0 and Microsoft Windows V3.1, English
QB-MESPA-SA	Same as above in French
QB-MESSA-SA	Same as above in Spanish
PCPXQ-BA	MS-DOS V4.0, Microsoft Windows V3.0, and QEMM V5.1
QB-MRSAA-SA	OS/2 operating system V1.3, Presentation Manager, and system supplemental kit. Minimum requirements are 4 Mbytes of memory, a diskette drive, and a 40-Mbyte hard disk.
PCPXQ-CA	MS OS/2 V1.21 with Presentation Manager

Step 3—Power Cord (Not required for 120-V systems)

BN24R-2E	Australia, New Zealand
BN19W-2E	Austria, Belgium, France, Germany, Holland, Spain, Sweden, Portugal
BN19K-2E	Denmark
BN22Z-2E	India
BN22P-2E	Israel
BN19Z-2E	Italy
BN24T-2E	Switzerland
BN26B-2E	U.K./Ireland, Hong Kong, Singapore
BNE4J-2E	Japan (240 V)

Step 4–Memory

System includes 2 Mbytes of memory; maximum is 8 Mbytes. Memory ordered with base unit ships with the base unit and with instructions for easy installation. Select maximum of one additional memory card:

PCP1M-BA	2-Mbyte DECpc 320P memory card; system maximum 4 Mbytes
PCP1M-BB	4-Mbyte DECpc 320P memory card; system maximum 6 Mbytes
PCP1M-BC	6-Mbyte DECpc 320P memory card; system maximum 8 Mbytes

Step 5—Math Coprocessor

Math coprocessor ordered with base unit ships with the base unit and with instructions for easy installation.

PCXAP-BB	DECpc 320P 20-MHz math coprocessor

Step 6—Ethernet Controller Card

Q6VU5-CZ	Pocket Ethernet adapter

Step 7—Video Monitor (optional)

Monitors include country-specific power cord, 120-V/240-V Northern Hemisphere/240-V Southern Hemisphere.

PC4XV-B2/B6/B7	14-inch multisynchronous color monitor; supports VGA (640 × 480), SVGA (800 × 600), SVGA Plus (1024 × 768), and 8514/A (1024 × 768). Requires cable PC4XC-BB.
PC4XC-BB	Monitor-to-PC cable, required when using full-sized monitor with DECpc 320P.

Step 8—Full-Size Keyboard (Optional)

PCXAL-AA	101-key PC-style keyboard

Step 9—Additional Optional Devices

PCP1H-BB	Extra battery pack
PCP1H-EA	Extra ac adapter
PCP1C-XA	Leather carrying case

DECpc Desktop Computers

The desktop members of the DECpc family share a number of common features.

- Industry-standard IBM PC/XT and PC/AT compatibility
- A choice of MS-DOS (V4.01 or V5.0 with Microsoft Windows) or OS/2 V1.3 Standard Edition operating system with Presentation Manager
- A choice of 101-key industry-standard keyboard or Digital's Gold-key style keyboard with keycaps available in five languages
- Support for Digital's wide range of serial and parallel desktop printers
- Capabilities for sharing resources on the network through products of the PATHWORKS family
- Support for PC DECwindows Display Facility software, allowing users to display and manipulate VMS and ULTRIX DECwindows applications running on VAX and RISC systems on the network
- Worldwide service and support through the Digital Services organization

Step 1—Systems

Packaged Systems

Packaged systems are complete systems. They include memory, storage, software, and frequently requested options, all packaged under a single order number for easy ordering. No additional components should be added to a packaged system. If a different configuration is required, select an *a-la-carte* system and add the necessary components.

For current packages and pricing in this rapidly changing market, call *Desktop Direct.* (In the U.S., 800-PC-BY-DEC. In other countries, contact your local sales office.)

A-La-Carte Systems

For an *A-La-Carte* system, complete Steps 1 through 5; add general purpose options as required. 120-V systems include power cord. For non-U.S. systems order power cord.

Note: Specify ASSEMBLY REQUIRED and NO PARTIALS on order form if system is to be delivered already assembled.

120 V/240 V

PC444-AA/A3	DECpc 316sx, 16 MHz, 80386sx, 1 Mbyte of memory, 1.44-Mbyte 3.5-inch diskette drive, SVGA Plus, IDE controller, mouse/keyboard ports, serial/parallel ports.
PC443-AA/A3	DECstation 320sx, 20 MHz, 80386sx, 1 Mbyte of memory, 1.44-Mbyte 3.5-inch diskette drive, SVGA+, IDE controller, mouse/keyboard ports, serial/parallel ports.
PC445-AA/A2/A3	DECpc 420sx, 20 MHz, 80486 with 4-Mbyte memory, 1.44-Mbyte 3.5-inch diskette drive, SVGA, IDE controller, mouse/keyboard ports, serial/parallel ports.
PC462-AA/A3	DECstation 325c, 25 MHz, 80386 with 32-Kbyte cache, 1.44-Mbyte 3.5-inch diskette drive, IDE controller, mouse/keyboard ports, serial/parallel ports.
PC463-AA/A3	DECstation 333c, 33 MHz, 80386 with 32-Kbyte cache, 1.44-Mbyte 3.5-inch diskette drive, IDE controller, mouse/keyboard ports, serial/parallel ports.
PC465-AA/A3	DECstation 425c, 25 MHz, 80486 with 8-Kbyte cache, 1.44-Mbyte 3.5-inch diskette drive, IDE controller, mouse/keyboard ports, serial/parallel ports.

Step 2—Keyboard and Power Cord

Keyboard	Power Cord	
PCXAL-AA	**BN26J-1K**	U.S./Canada/Japan (included in 120-V base system)
PCXAL-AB	**BN19W-2E**	Belgium
PCXAL-AD	**BN19K-2E**	Denmark
PCXAL-AP	**BN19W-2E**	France
PCXAL-AG	**BN19W-2E**	Germany
PCXAL-AA	**BN22Z-2E**	India
PCXAL-AI	**BN19Z-2E**	Italy
PCXAL-AN	**BN19W-2E**	Norway
PCXAL-AR	**BN19W-2E**	Spain (international)
PCXAL-AS	**BN19W-2E**	Spain
PCXAL-AA	**BN24R-2E**	New Zealand/Australia
PCXAL-AT	**BN22P-2E**	Israel
PCXAL-AV	**BN19W-2E**	Portugal
PCXAL-CA	**BN19W-2E**	Sweden/Finland
PCXAL-CH	**BN24T-2E**	Switzerland 102-key
PCXAL-AE	**BN26B-2E**	U.K./Ireland 102-key
	BNE4J-1K	Japan (240 V)
LK450-AA		Digital Gold-key keyboard (U.S./U.K.)
LK450-AS		Digital Gold-key keyboard (Spanish)
LK450-AC		Digital Gold-key keyboard (Canadian/French)
LK450-AQ		Digital Gold-key keyboard (Canadian/English)

Step 3—Operating System

Select an operating system.

QB-MESAA-SA	MS-DOS V5.0 operating system with Microsoft Windows V3.1 (English)
QB-MESPA-SA	Same as above in French
QB-MESSA-SA	Same as above in Spanish
QB-MSVAA-SA	Microsoft Windows V3.1 upgrade kit, English
QB-MSVPA-SA	Same as above in French
QB-MSVSA-SA	Same as above in Spanish
QB-MSUAA-SA	MS-DOS operating system V5.0, English
QB-MSUPA-SA	Same as above in French
QB-MSUSA-SA	Same as above in Spanish
PC4XQ-BA	MS-DOS V4.01 operating system, and QEMM V5.1 (English)
QB-MRSAA-SA	OS/2 operating system V1.3 with Presentation Manager and system supplemental kit. Minimum requirements are 4 Mbytes of memory, a diskette drive, and a 40-Mbyte hard disk
PC4XQ-CA	OS/2 V1.21 operating system with Presentation Manager (English)
QB-YN2AW-VA	SCO UNIX V3.2.2 operating system, two-user, 3.5-inch high-density diskette (for DECstation 325c, 333c, and 425c)
QB-YN2AW-VB	SCO UNIX V3.2.2 operating system, multiuser, 3.5-inch high-density diskette (for DECstation 325c, 333c, and 425c)
QB-GF1AW-VA	SCO UNIX V3.2.2 operating system development system, 3.5-inch high-density diskette (for DECstation 325c, 333c, and 425c)
QB-YN2AW-VD	SCO UNIX V3.2.2 operating system, two-user, QIC tape (for DECstation 325c, 333c, and 425c)
QB-YN2AW-VE	SCO UNIX V3.2.2 operating system, multiuser, QIC tape (for DECstation 325c, 333c, and 425c)
QB-YN8AW-VB	Open Desktop V1.1.1 operating system, QIC tape (for DECstation 325c, 333c, and 425c)
QB-GF4AW-VA	Open Desktop V1.1.0 server upgrade, 3.5-inch high-density diskette (for DECstation 325c, 333c, and 425c)
QB-GF5AW-VB	Open Desktop V1.1 development system, QIC tape (for DECstation 325c, 333c, and 425c)

Step 4—Memory

Select system memory. Requirements for system memory are operating system and application dependent. Check guidelines provided in operating system and application literature. Digital recommends a minimum of 4 Mbytes on systems using DOS and Microsoft Windows together and a minimum of 8 Mbytes on systems using OS/2 or SCO UNIX operating systems.

Note: All DECpcs must contain a minimum of 1-Mbyte memory; Digital will not ship systems without memory installed.

DECpc 316sx and DECstation 320sx

PC44M memory expansion adapter allows expansion to 13 Mbytes. Select memory in quantities listed below:

For a total memory of:	Order this quantity:	of this Order Number:
1 Mbyte	0	**Included**
2 Mbytes	2	**PC4XM-CA**
3 Mbytes	1	**PC4XM-CB**
5 Mbytes	2	**PC4XM-CB**
6 Mbytes	2	**PC4XM-CA**
	2	**PC4XM-CB**
	1	**PC44M-AA**
8 Mbytes	2	**PC4XM-CA**
	3	**PC4XM-CB**
	1	**PC44M-AA**
13 Mbytes	6	**PC4XM-CB**
	1	**PC44M-AA**

DECpc 420sx

Select memory in quantities listed below:

For a total memory of:	Order this quantity:	of this Order Number:
4 Mbytes	0	**(Included)**
5 Mbytes	2	**PC4XM-CA**
8 Mbytes	2	**PC4XM-CB**
16 Mbytes*	2	**PC4XM-DC**
20 Mbytes	2	**PCXAM-DC**
32 Mbytes*	4	**PCXAM-DC**

* Requires removal of factory-installed 4 Mbytes

DECstation 325c, 333c, and 425c

PC46M-AA memory expansion adapter allows expansion to 16 Mbytes. Select memory in quantities listed below:

For a total memory of:	Order this quantity:	of this Order Number:
1 Mbyte	2	**PC4XM-CA**
2 Mbytes	4	**PC4XM-CA**
4 Mbytes	2	**PC4XM-CB**
8 Mbytes	4	**PC4XM-CB**
10 Mbytes	4	**PC4XM-CB**
	4	**PC4XM-CA**
	1	**PC46M-AA**
16 Mbytes	8	**PC4XM-CB**
	1	**PC46M-AA**

PC4XM-CA	512-Kbyte memory kit (DECstation and DECpc 316sx PCs only)
PC4XM-CB	2-Mbyte memory kit (DECstation and DECpc 316sx PCs only)
PC46M-AA	Zero K memory expansion adapter for DECstation 325c, 333c, and 425c. Required when expanding memory to 10 Mbytes and higher.
PC44M-AA	Zero K memory expansion adapter for DECpc 316sx and DECstation 320sx. Required when expanding memory to 6 Mbytes or higher. Recommended limit of one. For configurations greater than 12 Mbytes, call Technical Pre-Purchase Assistance (800-343-4040).
PCXAM-DC	8-Mbyte 70-ns memory kit (DECpc 420sx) using two 4-Mbyte SIMMs.

Step 5—Monitor and Video Adapter

- Select a monitor and video adapter
- Monitors include video cable and country-specific power cord

-xA, x2 = 120 V Northern Hemisphere
-x3 = 240 V Northern Hemisphere
-x4 = 240 V Southern Hemisphere

PCXAV-AA/A3/A4	19-inch monochrome monitor 72 Hz (VR319)[1]
PC4XV-A2	14-inch VGA monochrome monitor, 64 shades of gray[2]
PC7XV-KB	Same as above, 240 V Northern Hemisphere[2]
PC7XV-KD	Same as above, 240 V Southern Hemisphere[2]
PCXAV-BA/B3/B4	19-inch color monitor 72 Hz (VR320)[1]
PCXAV-DA/D3/D4	19-inch Trinitron color monitor 66 Hz (VRT19)[1]
PCXAV-CA/C3/C4	16-inch Trinitron color monitor 66 Hz (VRT16)[1]
PC4XV-B2/B6	14-inch VGA multisynchronous color monitor supports VGA (640 × 480), SVGA (800 × 600), SVGA Plus (1024 × 768), and 8514/A (1024 × 768).[2]
PC7XV-CC	Same as above, Southern Hemisphere[2]
PCXCV-B2/B3/B4	14-inch VGA single synchronous color monitor, 640 × 480[2]

Note 1: Requires PCXAG-AD graphics adapter.

Note 2: Requires PC4XG-AC graphics adapter.

Step 5a—Video Adapter

DECpc 420sx:

PC4GM-AA	512-Kbyte video RAM upgrade kit to support 1024 × 768 × 256 color video

The DECstation 325c, 333c, and 425c offer the user a range of graphic options. The following adapters will support these systems and the monitors listed above.

PCXAG-AC	Super VGA Plus 1024 × 768 high-resolution graphics adapter (standard on DECpc 420sx); also supports Super VGA and VGA modes. Includes 512-Kbyte video RAM. Used with DECpc VGA monitor (PCXCV-Bx), VGA monochrome monitor (PC4XV-Ax), and VGA multisynchronous color monitor (PC4XV-Bx).
PC4XG-BA	8514/A 1024 × 768 high-resolution graphics adapter provides 1024 × 768 interlaced and non-interlaced modes. Provides 256 colors and 1-Mbyte video RAM. Requires PCXAG-AC video adapter.
PCXAG-AD	1280 × 1024 high-resolution graphics adapter, includes VGA daughter board. Used with PCXAV-Bx, PCXAV-Cx, and PCXAV-Dx monitors above.

Step 6—Storage Devices

- Select optional storage devices.
- Devices selected are in addition to 3.5-inch diskette drive included in all systems.
- SCSI drives require a SCSI adapter (PC4XR-CC).
- 3.5-inch SCSI drive must be mounted in 5.25-inch storage bay.

DECpc 316sx, DECstation 320sx, and DECpc 420sx

Maximum of two drives
- No more than one additional diskette or 3.5-inch 60-Mbyte tape backup drive and
- No more than one SCSI or 5.25-inch device

DECstation 325c, 333c, and 425c

Maximum of three drives
- No more than one additional diskette or 3.5-inch 60-Mbyte tape backup drive and
- No more than two SCSI devices or
  Two 5.25-inch half-height devices or
  Two IDE drives

Step 6—Storage Devices *(Continued)*

Diskette or tape drive

A 3.5-inch tape drive uses the diskette drive interface standard on the DECpc 316sx and 420sx and all DECstation personal computers.

PC4XT-CA	60-Mbyte 3.5-inch tape drive
PC4XT-DA	60-Mbyte tape cartridge for above tape drive (PC4XT-CA)
PC4XR-FA	1.44-Mbyte 3.5-inch diskette drive
PC4XR-GA	360-Kbyte 5.25-inch diskette drive
PC4XR-EA	1.2-Mbyte 5.25-inch diskette drive

Step 6a—IDE Hard Disk Drives

Integrated Digital Electronics (IDE) disks provide midrange performance for DECpc 316sx and all DECstation personal computers.

PC4XR-BD	52-Mbyte 3.5-inch hard disk drive
PC4XR-EB	105-Mbyte 3.5-inch hard disk drive
PCXAR-CA	120-Mbyte 3.5-inch hard disk drive
PCXAR-CB	240-Mbyte 3.5-inch hard disk drive

Step 6b—SCSI Adapter (Required for SCSI Devices)

Small Computer Storage Interface (SCSI) disks and tapes provides high-performance throughput required by servers and database management or graphics-intensive applications for DECstation and DECpc 316sx personal computers.

PC4XR-CC	SCSI adapter board with external connector ports.

Step 6c—SCSI Devices

PCXAR-AG	245-Mbyte 3.5-inch hard disk drive; must be mounted in 5.25-inch storage bay
PCXAR-AB	426-Mbyte 3.5-inch hard disk drive; must be mounted in 5.25-inch storage bay
PC4XR-HA	320-Mbyte 5.25-inch hard disk drive
PC4XT-AA	150-Mbyte 5.25-inch SCSI tape drive (DECstation 325c, 333c, and 425c)
PC4XT-BA	150-Mbyte tape cartridge for above tape drive (PC4XT-AA)

DECstation 325c, 333c, and 425c only

PCXAT-AA	SCSI 525-Mbyte 5.25-inch quarter-inch cartridge (QIC) for SCO
PCXAT-AB	SCSI 525-Mbyte 5.25-inch quarter-inch cartridge (QIC) for DOS
PCXAT-AC	SCSI 525-Mbyte 5.25-inch quarter-inch cartridge (QIC) for OS/2; requires SCSI adapter (PC4XR-CC) when using OS/2 V1.21

Step 7—Math Coprocessor (Optional)

Select optional math coprocessor.

PCXAP-BA	DECpc 316sx 16-MHz Intel 80387sx math coprocessor
PCXAP-BB	DECstation 320sx 20-MHz Intel 80387sx math coprocessor
PCXAP-CC	DECstation 325c 25-MHz Intel 80387 math coprocessor
PCXAP-CD	DECstation 333c 33-MHz Intel 80387 math coprocessor
PCXAP-DA	DECstation 425c 25-MHz Weitek 4167 math coprocessor

Step 8—Communications Options

Select communications options—maximum of two. If more than two adapters are required, consult a technical support specialist. Special configuration rules apply.

PC4XD-AA	One serial and one parallel port adapter.
PC4XD-AB	Two-port serial adapter
DE100-AA	EtherWORKS LC Ethernet adapter
PC4XD-CA	2400 bit/s modem adapter.

Step 9—Accessories

PCXAS-AA	PS/2 and Microsoft-compatible three-button mouse.
DECpc 316sx	
PC44Y-CE	User documentation set (multilingual versions)
PC44Y-DD	Technical reference manual (English language only)
DECstation 320sx	
PC44Y-CC	User documentation set (multilingual versions)
PC44Y-CD	Technical reference manual (English language only)
DECpc 420sx	
PC44Y-CF	User documentation set (multilingual versions)
PC44Y-EE	Technical reference manual (English language only)
DECstation 325c	
PC46Y-CB	User documentation set (multilingual versions)
PC46Y-DD	Technical reference manual (English language only)
DECstation 333c	
PC46Y-CC	User documentation set (multilingual versions)
PC46Y-DD	Technical reference manual (English language only)
DECstation 425c	
PC46Y-CE	User documentation set (multilingual versions)
PC46Y-BA	Technical reference manual (English language only)

DECpc 433 Workstation

The DECpc 433 workstation is a powerful, industry-standard personal computer for networked or standalone computing. It's ideal for windows and graphics-intensive applications in business and commercial environments. Based on the Intel 80486 microprocessor, the system incorporates a high-resolution color video controller that, in a standard configuration, provides unparalleled graphics performance of up to 1280 × 1024 pixels and 256 colors.

This 33-MHz system includes a built-in Ethernet or Token Ring adapter, 8-Mbyte RAM, a SCSI interface and adapter, IDE hard drive interface and diskette controller, and two serial/parallel ports. It supports DOS, OS/2, and SCO Open Desktop operating systems. It also supports Microsoft Windows, OS/2 Presentation Manager, SCO Open Desktop X Windows, GEM, PC DECwindows Motif, IBM 8514/A, and TIGA-34020 graphical interfaces.

Step 1—Base Systems

Select a base system. 120-V systems include a U.S. keyboard, mouse and power cord. If a non-U.S. system is selected, the appropriate keyboard, mouse, and power cord are required.

DECpc 433 Workstation Base System includes

- 8 Mbytes of memory, expandable to 48 Mbytes
- 101-key industry-standard keyboard (120 V)
- Power cord (120 V)
- Three-button serial mouse (120 V)
- Math coprocessor embedded on chip
- High-resolution color video controller
- SCSI interface and adapter
- IDE hard drive interface and diskette controller
- DEC EtherWORKS network interface

PCW10-AA	8-Mbyte RAM, Ethernet card, and bay interfaces for an optional 3.5-inch diskette or IDE hard disk drive; includes keyboard, mouse, and power cord (120 V).
PCW11-AA	DECpc 433 Workstation base system for Token Ring environments; same as above but with Token Ring card instead of Ethernet card.
PCW10-A2	8-Mbyte RAM, Ethernet card, and bay interfaces for an optional 3.5-inch diskette or IDE hard disk drive. Requires keyboard, mouse, and power cord.
PCW11-A2	DECpc 433 Workstation base system for Token Ring environments; same as above but with Token Ring card instead of Ethernet card.

Note: A 2.5-inch IDE hard disk drive can also be added along with the 3.5-inch diskette. Add memory, monitor, disks, operating system, and general-purpose options to meet user's needs.

Step 2—Operating System

Select an operating system.

QB-MESAA-SA	MS-DOS operating system V5.0 with Microsoft Windows V3.1. English version.
QB-MESPA-SA	Same as above in French
QB-MESSA-SA	Same as above in Spanish
QB-MSVAA-SA	Microsoft Windows V3.1 upgrade kit, English
QB-MSVPA-SA	Same as above in French
QB-MSVSA-SA	Same as above in Spanish
QB-MSUAA-SA	MS-DOS operating system V5.0, English
QB-MSUPA-SA	Same as above in French
QB-MSUSA-SA	Same as above in Spanish
QB-XNTAD-WA	MS-DOS V5.0 upgrade kit (3.5-inch diskette)

Step 2—Operating System *(Continued)*

PCWXQ-BA	MS-DOS operating system V4.01, Microsoft Windows V3.0, and QEMM V5.12. English version.
QB-MRSAA-SA	OS/2 operating system V1.3 with Presentation Manager and system supplemental kit. Minimum requirements are 4 Mbytes of memory, a diskette drive, and a 40-Mbyte hard disk.
PCWXQ-CA	OS/2 operating system V1.21: Presentation Manager, and system supplemental kit
QB-MH3AW-VA	SCO Open Desktop V1.1 for DECpc 433 Workstation (U.S. and Canada). This software is not customer installable. See Open Desktop Field Installation below for expert installation services. (To operate with SCO, the DECpc 433W requires 12 Mbytes of system memory, a diskette drive, and the expansion box with both a 525-Mbyte QIC tape drive and a 200-Mbyte hard disk.)
QB-MH3AW-VB	SCO Open Desktop V1.1 for DECpc 433 Workstation (International). This software is not customer installable. See Open Desktop Field Installation below for expert installation services. (To operate with SCO, the DECpc 433W requires 12 Mbytes of system memory, a diskette drive, and the expansion box with both a 525-Mbyte QIC tape drive and a 200-Mbyte hard disk.)
QT-YN8AW-I9	Open Desktop field installation for SCO Open Desktop operating system.

Step 3—Power Cord, Keyboard and Mouse (Not required for 120-V systems)

Select power cord, keyboard, and mouse for all non-U.S. systems.

Power Cord	Keyboard	
BN26J-1K	**PCXAL-AA**	U.S./Canada/Japan (120 V)
BN19W-2E	**PCXAL-AB**	Belgium
BN19K-2E	**PCXAL-AD**	Denmark
BN19W-2E	**PCXAL-AP**	France
BN19W-2E	**PCXAL-AG**	Germany
BN22Z-2E	**PCXAL-AA**	India
BN19Z-2E	**PCXAL-AI**	Italy
BN19W-2E	**PCXAL-AN**	Norway
BN19W-2E	**PCXAL-AR**	Spanish (international)
BN19W-2E	**PCXAL-AS**	Spain
BN24R-2E	**PCXAL-AA**	New Zealand/Australia
BN22P-2E	**PCXAL-AT**	Israel
BN19W-2E	**PCXAL-AV**	Portugal
BN19W-2E	**PCXAL-CA**	Sweden/Finland
BN24T-2E	**PCXAL-CH**	Switzerland 102-key
BN26B-2E	**PCXAL-AE**	U.K./Ireland 102-key
BNE4J-2E		Japan (240 V)
	LK450-AA	Digital Gold-key style (U.S./.U.K.)
	LK450-AC	Same as above, French Canadian
	LK450-AQ	Same as above, French Canadian/English
	LK450-AS	Same as above, Spanish
Mouse	**PCXAS-AA**	Three-button mouse

Step 4—Video Monitor

- Select a video monitor.
- Monitors include video cable and country-specific power cord.
- Monitors operate at 1280 × 1024 resolution.

-xA = 120 V Northern Hemisphere
-x3 = 240 V Northern Hemisphere
-x4 = 240 V Southern Hemisphere

PCXAV-AA/A3/A4	19-inch monochrome monitor 72 Hz (VR319)
PCXAV-BA/B3/B4	19-inch color monitor 72 Hz (VR320)
PCXAV-CA/C3/C4	16-inch Trinitron color monitor 66 Hz (VRT16)
PCXAV-DA/D3/D4	19-inch Trinitron color monitor 66 Hz (VRT19)

Step 5—Storage

- System is configured as a diskless network client and does not have a storage device unless one or more are ordered from the list below.
- System supports two external SCSI expansion boxes.

Step 5a—Internal Storage

Internal storage options are:

- One 3.5-inch hard disk drive, or
- One 3.5-inch diskette drive, or
- One 2.5-inch 40-Mbyte or 80-Mbyte IDE plus one 3.5-inch diskette drive

PCWXR-AA	1.44-Mbyte 3.5-inch internal diskette drive
PCWXR-CA	40-Mbyte 2.5-inch internal IDE hard disk drive
PCXAR-BA	80-Mbyte 2.5-inch internal IDE hard disk drive
PCWXR-BA	52-Mbyte 3.5-inch IDE hard disk drive
PCWXR-BB	105-Mbyte 3.5-inch IDE hard disk drive

Step 5b—External Storage

Select maximum of two SCSI expansion boxes. Expansion box has three half-height storage bays: two front accessible 3.5-inch/5.25-inch bays and one internal 3.5-inch bay.

PCWXE-AA	Expansion box for SCSI devices (U.S.)
PCWXE-AB	Expansion box for SCSI devices (international)

Select SCSI storage devices for expansion box(es).

- Maximum of two 5.25-inch half-height devices
- Maximum of two tape drives
- Maximum of three 3.5-inch half-height devices

PC4XR-DA	170-Mbyte 5.25-inch SCSI hard disk drive
PC4XR-HA	320-Mbyte 5.25-inch SCSI hard disk drive
PCXAR-AG	245-Mbyte 3.50-inch SCSI hard disk drive
PCXAR-AB	426-Mbyte 3.50-inch SCSI hard disk drive
PCXAR-AC	852-Mbyte 3.50-inch SCSI hard disk drive
PCXCR-BC	600-Mbyte CD-ROM kit (DOS) for DECpc 433W
PCXAT-AB	525-Mbyte half-height Quarter Inch Cartridge (QIC) tape for DOS
PCXAT-AA	525-Mbyte half-height Quarter Inch Cartridge (QIC) tape for SCO

Step 6—Memory

System includes 8 Mbytes of memory (maximum 48 Mbytes). Select memory in quantities listed below:

For a total memory of:	Order this quantity:	of this Order Number:
8 Mbytes	0	**Included**
12 Mbytes	2	**PCXAM-DB**
24 Mbytes	2	**PCXAM-DC**
36 Mbytes	4	
48 Mbytes	6	

PCXAM-DB	2-Mbyte (2 × 1-Mbyte SIMM) upgrade
PCXAM-DC	8-Mbyte (2 × 4-Mbyte SIMM) upgrade

Step 6a—Cache Memory

Select cache memory, if required (maximum of one upgrade).

PCWXM-AA 64-Kbyte cache expansion upgrade
PCWXM-AB 128-Kbyte cache expansion upgrade

Step 6b—Video Memory

Select memory in quantities listed below:

For a total memory of:	Order this quantity:	of this Order Number:
4 Mbytes	2	**PCXAM-DB**
16 Mbytes	2	**PCXAM-DC**

PCXAM-DB 2-Mbyte (2 × 1-Mbyte SIMM) upgrade
PCXAM-DC 8-Mbyte (2 × 4-Mbyte SIMM) upgrade

Step 7—Math Coprocessor

Note: Math coprocessor is included in the 486 33-MHz DX chip.

Step 8—Video Coprocessor

PCXAP-EA Video coprocessor

Step 9—Documentation

ER-PCW1A-TR DECpc 433 Workstation Series Technical Reference Manual (Ethernet and Token Ring)

DECpc 400ST Deskside Computers

The DECpc 400ST Series is designed to meet users' computing needs as they grow, using Intel's Xpress technology for easy upgrades and expandability. The 400ST Series has a scalable design that goes beyond modularity. This scalability makes the entire DECpc 400ST Series of computers ready to run Intel's P5 next generation of processors as soon as they are available, providing computing power for today and P5 investment protection for tomorrow.

The DECpc 400ST series is a family of industry-standard, 80486-based personal computers that are compliant with the Extended Industry Standard Architecture (EISA). Each DECpc 400ST system offers six internal 32-bit expansion slots and five half-height storage bays for hard disk, diskette, or tape drives and carries a 254-Watt autosensing power supply.

The DECpc 400ST family is built on a modular design that allows each member of the family to start with the same chassis, power supply, and motherboard. All speed-graded parts are on a plug-in processor card that is user-interchangeable and upgradable. The design also supports increases in chip speeds. Initial variations are the Intel 80486sx at 25 MHz, the 80486 at 33 MHz, and the 80486 at 50 MHz.

Suited to the desktop or deskside environment, the DECpc 400ST family offers increased storage in a small-tower design that can be used either vertically or horizontally, depending on user preference and need.

Step 1—Systems

- Select Base System with CPU kit and all hardware options factory installed and tested. 120-V systems include power cord and U.S. keyboard. 240-V systems require country-specific power cord and keyboard.
- Select a-la-carte system with CPU kit and all hardware options as line items for field/customer installation **only**. A-la-carte systems require country-specific power cord and keyboard.
- Software options ship at same time, but are not factory installed.

DECpc 400ST systems include:

- Intel 80486 processors with choice of 25-MHz, 33-MHz or 50-MHz CPU module
- 4-Mbyte memory, expandable to 192 Mbytes
- 25-MHz and 33-MHz systems support an external cache upgrade (64 or 128 Kbytes)
- 50 MHz system includes 256-Kbyte external cache
- 1.44-Mbyte 3.5-inch diskette drive
- Four additional storage bays (one 3.5-inch, three 5.25-inch)
- Diskette and IDE controllers
- Six EISA expansion slots
- Two serial, one parallel, mouse and keyboard ports
- U.S. keyboard and power cord (120-V Base Systems)
- User documentation
- User diagnostics
- 254-W autosensing power supply

Order Number 120 V/240 V	Model	CPU	Memory	Cache
Base Systems				
PCT15-AA/A2	DECpc 425ST	25 MHz	4-Mbyte	8-Kbyte[1] internal
PCT20-AA/A2	DECpc 433ST	33 MHz	4-Mbyte	8-Kbyte[1] internal
PCT25-AA/A2	DECpc 450ST	50 MHz	4-Mbyte	8-Kbyte internal, 256-Kbyte external
A-la-carte System (Options Field/Customer Installable ONLY)				
BA55-A9[3]	DECpc 400ST	Option	4-Mbyte	Option[2]

[1] Systems support an external cache upgrade (64 or 128 Kbytes)
[2] Systems ordered with 50-MHz CPU include 256-Kbyte external cache
[3] Does not include keyboard or power cord; order these items as separate line items in Step 3.

Step 1a—CPU Kit (Field/Customer Installable)

PCT16-A2	25-MHz CPU upgrade kit with user-installable 486sx processor card, installation guide, and snap-in DECpc logo
PCT21-A2	33-MHz CPU upgrade kit with user-installable 486DX processor card, installation guide, and snap-in DECpc logo
PCT26-A2	50-MHz CPU upgrade kit with user-installable 486DX processor card, 256-Kbyte external cache, installation guide, and snap-in DECpc logo

Step 2—Operating System (Required for all systems)

QB-MESAA-SA	MS-DOS V5.0 operating system with Microsoft Windows V3.1; English
QB-MESPA-SA	Same as above in French
QB-MESSA-SA	Same as above in Spanish
QB-MSVAA-SA	Microsoft Windows V3.1 upgrade kit, English
QB-MSVPA-SA	Same as above in French
QB-MSVSA-SA	Same as above in Spanish
QB-MSUAA-SA	MS-DOS operating system V5.0, English
QB-MSUPA-SA	Same as above in French
QB-MSUSA-SA	Same as above in Spanish
QB-MRSAA-SA	OS/2 V1.3 operating system

U.S./Canada:

QB-MN8AW-VA	SCO UNIX V3.2.4 operating system, two-user, 3.5-inch diskette
QB-MN8AW-VB	SCO UNIX V3.2.4 operating system, multiuser, 3.5-inch diskette
QB-MN8AW-VC	SCO UNIX V3.2.4 operating system, two-user, QIC tape
QB-MN8AW-VD	SCO UNIX V3.2.4 operating system, multiuser, QIC tape

International:

QB-MN8AW-VE	SCO UNIX V3.2.4 operating system, two-user, 3.5-inch diskette
QB-MN8AW-VF	SCO UNIX V3.2.4 operating system, multiuser, 3.5-inch diskette
QB-MN8AW-VG	SCO UNIX V3.2.4 operating system, two-user, QIC tape
QB-MN8AW-VH	SCO UNIX V3.2.4 operating system, multiuser, QIC tape

Step 3—Power Cords and Keyboards

Select country-specific power cord and keyboard for a-la-carte and 240-V systems.

Power Cord	and Keyboard	Country	Language
BNE4H-2E*	**PCXAL-AA***	U.S./Canada/Japan	English
BN19W-2E	**PCXAL-AB**	Belgium	Belgian
BN19K-23	**PCXAL-AD**	Denmark	Danish
BN19W-2E	**PCXAL-AP**	France	French
BN19W-2E	**PCXAL-AG**	Germany	Austrian/German
BN19W-2E	**PCXAL-AN**	Norway	Norwegian
BN19W-2E	**PCXAL-AV**	Portugal	Portuguese
BN19W-2E	**PCXAL-AR**	Spanish	Spanish (international)
BN19W-2E	**PCXAL-AS**	Spain	Spanish
BN19W-2E	**PCXAL-CA**	Sweden	Swedish/Finnish
BN24R-2E	**PCXAL-AA**	Australia/N.Z.	English
BN19A-2E	**PCXAL-AE**	U.K./Ireland	English/U.K.
BN24T-2E	**PCXAL-CH**	Switzerland	Swiss
BN22P-2E	**PCXAL-AT**	Israel	Hebrew
BN19Z-2E	**PCXAL-AI**	Italy	Italian
BN19S-2E	**PCXAL-AA**	India	English
BNE4J-2E		Japan (240 V)	

* Included in 120-V Base Systems

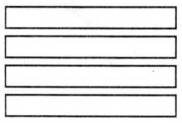
Step 4—Memory

Systems includes 4 Mbytes of memory. Main logic board accommodates two memory banks, two slots per bank. Optional memory expansion card accommodates four banks, two slots per bank for a system total of 12 memory slots. SIMMs **must** be installed in pairs of matching size and speed.

Some memory configurations require removal of two 2-Mbytes SIMMs standard in all systems.

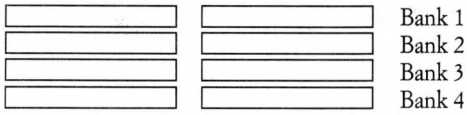
Digital recommends a minimum of 4 Mbytes of memory on systems using MS-DOS and Microsoft Windows together and minimum of 8 Mbytes of memory on systems using the SCO UNIX operating system.

System memory board



(PCTAM-CC standard in all systems)

Optional memory expansion card (PCTXM-AA)



PCTAM-CC	4 Mbytes (2 × 2-Mbytes, 80 ns, 36-bit SIMMs)
PCTAM-CD	8 Mbytes (2 × 4-Mbytes, 80 ns, 36-bit SIMMs)
PCTAM-CE	16 Mbytes (2 × 8-Mbytes, 80 ns, 36-bit SIMMs)
PCTAM-DF	32 Mbytes (2 × 16-Mbytes, 70 ns, 36-bit SIMMs)
PCTXM-AA	Memory expansion card; four banks, two SIMM slots per bank; maximum of one expansion card per system

Note: If factory installation is selected, two additional SIMM kits ordered without memory expansion card require removal of standard 4-Mbyte (2 × 2 Mbytes) SIMMs. These SIMMs will be shipped to customer for future upgrades.

Step 5—Cache Memory Upgrade (Optional)

External cache upgrades supported on 25-MHz and 33-MHz systems only. Maximum of one upgrade kit per system.

PCWXM-AA	64-Kbyte external cache upgrade kit
PCWXM-AB	128-Kbyte external cache upgrade kit

Step 6—Video Monitors

Select video monitor and video adapter. Monitors include video cable and country-specific power cord.

120 V/ 240 V/S.H.

PCXAV-BA/B3/B4	19-inch color monitor, 1280 × 1024, 72 Hz (VR320); requires PCXAG-AD adapter
PCXAV-DA/D3/D4	19-inch color monitor, 1280 × 1024, 66 Hz, (VRT19) Trinitron; requires PCXAG-AD adapter
PCXAV-EA	16-inch SVGA Plus multisynchronous, non-interlaced color monitor; requires either PCXAG-AC or PCXAG-AD video adapter
PCXAV-CA/C3/C4	16-inch color monitor, 1280 × 1024, 66 Hz, (VRT16) Trinitron; requires PCXAG-AD adapter
PC4XV-B2	14-inch VGA multisynchronous color monitor; supports VGA (640 × 480), SVGA (800 × 600), SVGA Plus (1024 × 768), and 8514/A (1024 × 768), 120 V; requires PCXAG-AC adapter
PCXCV-B2	14-inch VGA color monitor, supports 640 × 480; requires PCXAG-AC adapter
PCXAV-AA/A3/A4	19-inch monochrome monitor, 1280 × 1024, 72 Hz (VR319); requires PCXAG-AD adapter
PC4XV-A2	14-inch VGA monochrome monitor, 64 shades of gray, 120 V; requires PCXAG-AC adapter

Step 6a—Video Adapter

PCXAG-AD	1280 × 1024 high-resolution graphics adapter used with PCXAV-Ax, PCXAV-Bx, PCXAV-Cx, and PCXAV-Dx monitors above.
PCXAG-AC	SVGA+ graphics adapter for non-interlaced monitors up to 1024 × 768.
PC4GM-AA	VRAM upgrade kit, 512 Kbytes

Step 7—Storage

Systems include one 1.44-Mbyte 3.5-inch diskette drive; four additional storage bays are available (one 3.5-inch, three 5.25-inch). SCSI devices require a controller; see Step 7a. Select additional devices if required.

- Maximum of two IDE devices
- Maximum of four 42-mm-high devices
- Maximum of three 5.25-inch, half-height devices
- Maximum of one 5.25-inch, full-height device (uses two half-height bays)
- Maximum of one additional diskette drive

Select maximum of one additional diskette drive:

PCXDR-AA	1.44-Mbyte 3.5-inch, 42-mm half-height diskette drive	One 5.25-inch bay
PC4XR-EA	1.2-Mbyte 5.25-inch, half-height diskette drive	One bay

Select maximum of two IDE disks:

PC4XR-BD	52-Mbyte 3.5-inch, 25-mm half-height IDE disk	One bay
PC4XR-EB	105-Mbyte 3.5-inch, 25-mm half-height IDE disk	One bay
PCXAR-CA	120-Mbyte, 3.5-inch, 25-mm half-height IDE disk	One bay
PCXAR-CB	240-Mbyte, 3.5-inch, 25-mm half-height IDE disk	One bay

SCSI devices require SCSI controller from Step 7a.

PCXAR-AG	245-Mbyte 3.5-inch, 42-mm full-height SCSI hard drive	One bay
PCXAR-AB	426-Mbyte 3.5-inch, 42-mm full-height SCSI hard drive	One bay
PCXAR-AC	852-Mbyte 3.5-inch, 42-mm full-height SCSI hard drive	One bay
PCXBR-AB	1-Gbyte 5.25-inch, full-height SCSI disk drive	Two bays
PCXCR-BA	600-Mbyte CD-ROM kit (DOS) for DECpc 400ST (152x support)	
PCXCR-BC	600-Mbyte CD-ROM kit (DOS) for DECpc 400ST (154x and 174x support)	
PCXAT-AA	525-Mbyte 5.25-inch, half-height QIC tape drive for SCO	One bay
PCXAT-AB	525-Mbyte 5.25-inch, half-height QIC tape drive for DOS	One bay

Step 7a—SCSI Controller (Required if SCSI devices are selected)

PCTAZ-AB	32-bit high-performance EISA SCSI controller
PCTAZ-AA	16-bit low-cost SCSI controller

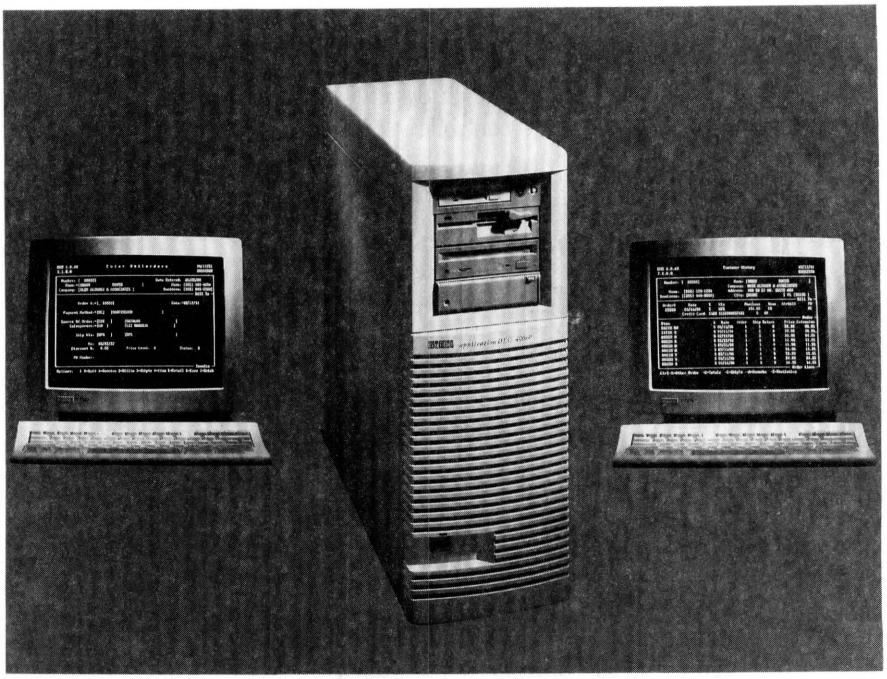
Step 8—Ethernet Controller Cards

DE100-AA	EtherWORKS LC Ethernet adapter
DE101-AA	EtherWORKS LC/TP Ethernet adapter
DE200-AC	EtherWORKS Turbo Ethernet adapter
DE201-AC	EtherWORKS Turbo/TP Ethernet adapter

Step 9–Accessories (Optional)

LK450-AA	Digital Gold-key keyboard, English
LK450-AC	Digital Gold-key keyboard, Canadian French
LK450-AQ	Digital Gold-key keyboard, French Canadian/English
LK450-AS	Digital Gold-key keyboard, Spanish
PC4XD-AA	One serial and one parallel port adapter
PC4XD-AB	Two-port serial adapter
PC4XD-CA	2400-baud modem
PCXAS-AA	Extra 3-button mouse (included with system)
PCT15-UD	Multilingual documentation set for DECpc 425ST, 433ST, and 450ST
PCT15-TR	Technical reference manual for DECpc 425ST, 433ST, and 450ST

applicationDEC 400xP



Product Description

The applicationDEC 400xP is a floor-mounted uniprocessor tower based on the Intel-based i486 technology. Base design allows for plug-in processor choice of three processor speeds: 25SX, 33DX, or 50DX. Flexibility designed into the enclosure and logic design allows for processor speeds upgrade path, expansion of memory, and internal and external storage devices. The applicationDEC 400xP functions well in all application environments: multi-user timeshare, server, or single-user workstation. Operating systems supported include SCO UNIX, MS-DOS and Windows, OS/2, as well as certification for Novell NetWare and Banyan Vines.

Configuration Examples:

	Single-User Workstation	Multi-User Timeshare	Server
Base CPU	486/25	486/50	486/33
Cache	0 KB	256 KB standard	64 KB add-on
Memory	8 MB: 2 × 2 MB standard + 2 × 2 MB add-on	36 MB: 2 × 2 MB standard + memory expansion card with two 2 × 8 MB add-on	20 MB: 2 × 2 MB standard + 2 × 8 MB add-on
VGA	1024 × 768 256 color 512 KB standard + 512 KB VRAM add-on	1024 × 768 16 color standard	1024 × 768 16 color standard
Accessible Storage	1.44-MB 3.5-inch floppy standard + 1.2-MB 5.25-inch floppy	1.44-MB 3.5-inch floppy standard + 320/525 MB QIC tape	1.44-MB 3.5-inch floppy standard + 320/525 MB QIC tape
Fixed Disk	105-MB IDE	852-MB SCSI	490-MB SCSI (2 × 245 MB)
Disk Controller	IDE (std) + internal IDE cable	AHA 1540B	AHA 1740A
Console	16-inch color VGA, keyboard, mouse	14-inch monochrome VGA, keyboard, mouse	14-inch monochrome VGA, keyboard
Multiplexer Options	None	e.g., 48 users: 2 MUX + 4 additional terminal concentrators	None
Ethernet	None	None	None
Operating System	MS-DOS 5.0 with Microsoft Windows 3.0	SCO UNIX 3.2.4	Novell NetWare
Accessory	2400-baud internal modem	None	None

applicationDEC 400xP

Step 1—Systems

applicationDEC 400xP hardware is customer installable. There are three methods of ordering/configuring these systems:

1. Select Base System with CPU kit and all hardware options factory installed and tested.
2. Select Base System with CPU kit factory installed **only** and all hardware options as line items for field/customer installation **only**.
3. Select a-la-carte system with CPU kit and all hardware options as line items for field/customer installation **only**.

Note: • 120-V systems include power cord, 240-V systems require country-specific power cord from Step 2.
• Software options arrive at the same time, but are not factory installed.

applicationDEC 400xP systems include:

- Intel 80486 processors with choice of 25-MHz, 33-MHz or 50-MHz CPU module
- 4-Mbyte memory, expandable to 192 Mbytes
- 25-MHz and 33-MHz systems support one external cache upgrade, 64 or 128 Kbytes
- 50-MHz systems include 256-Kbyte external cache
- 1.44-Mbyte 3.5-inch diskette drive
- Seven additional half-height storage bays, three accessible, four hidden
- Standard on-board controllers: IDE, diskette, 1024 × 768 VGA (512-Kbyte video RAM standard, with expansion to 1 Mbyte)
- I/O expansion: eight 32-bit EISA slots (six master, two slave)
- Ports: two serial, one parallel, mouse, keyboard,
- Auxiliary IEC 320 monitor outlet
- Installation guide
- User diagnostics
- 350-W autosensing line voltage

Order Number 120 V/240 V	Model	CPU	Memory	Cache[2]
Base Systems—Options Factory Installed and Tested				
PS201-AA/A3	applicationDEC 400xP	25 MHz	4-Mbyte	0-Kbyte[1]
PS202-AA/A3	applicationDEC 400xP	33 MHz	4-Mbyte	0-Kbyte[1]
PS203-AA/A3	applicationDEC 400xP	50 MHz	4-Mbyte	256-Kbyte
Base Systems—Options Field/Customer Installable Only				
PS201-BA/B3	applicationDEC 400xP	25 MHz	4-Mbyte	0-Kbyte[1]
PS202-BA/B3	applicationDEC 400xP	33 MHz	4-Mbyte	0-Kbyte[1]
PS203-BA/B3	applicationDEC 400xP	50 MHz	4-Mbyte	256-Kbyte
A-la-Carte Systems (Select CPU and Options, Field/Customer Installable Only)				
PS200-AA/A3	applicationDEC 400xP	Option	4-Mbyte	Option[2]

[1] Systems support one external cache upgrade (64 or 128 Kbyte)
[2] Systems ordered with 50-MHz CPU include 256-Kbyte external cache.

Step 1a—CPU Kit (Required for A-la-Carte systems)

PS2XK-AA	25-MHz CPU card for applicationDEC 400xP, 0-Kbyte cache[1]
PS2XK-BA	33-MHz CPU card for applicationDEC 400xP, 0-Kbyte cache[1]
PS2XK-CA	50-MHz CPU card for applicationDEC 400xP, 256-Kbyte external cache

[1] Systems support one external cache upgrade (64 or 128 Kbyte)

Step 2—Power cords (Not required for 120-V systems)

BN26J-1K	U.S./Canada/Japan, 120 V (included with 120-V systems)
BN24R-2E	Australia/New Zealand
BN19W-2E	Austria, Belgium, France, Holland, Norway, Sweden, Portugal, Spain
BN26B-2E	U.K./Ireland
BN24T-2E	Switzerland
BN19K-2E	Denmark
BN22P-2E	Israel
BN19Z-2E	Italy
BN22Z-2E	India

Step 3—Operating System (Required for all systems)

Kits include software licenses, distribution media, and documentation. If mixing multiple operating systems, refer to operating system support hot line(s). No restriction mixing MS-DOS V5.0 and SCO UNIX V3.2.4.

QB-MESAA-SA	MS-DOS V5.0 operating system with Microsoft Windows V3.1, English
PC4XQ-BA	MS-DOS V4.01 operating system, English
PC4XQ-AA	MS-DOS V3.3 operating system, English
PCWXQ-CA	OS/2 V1.21 English

U.S./Canada

QB-YN2AW-VA	SCO UNIX V3.2.4 operating system, two-user, 3.5-inch diskette
QB-YN2AW-VB	SCO UNIX V3.2.4 operating system, multi-user, 3.5-inch diskette
QB-YN2AW-VD	SCO UNIX V3.2.4 operating system, two-user, QIC tape
QB-YN2AW-VE	SCO UNIX V3.2.4 operating system, multiuser, QIC tape

International

QB-YN2AW-VG	SCO UNIX V3.2.4 operating system, two-user, 3.5-inch diskette
QB-YN2AW-VH	SCO UNIX V3.2.4 operating system, multiuser, 3.5-inch diskette
QB-YN2AW-VK	SCO UNIX V3.2.4 operating system, two-user, QIC tape.
QB-YN2AW-VL	SCO UNIX V3.2.4 operating system, multiuser, QIC tape.

Note: SCO UNIX variants listed are for use on applicationDEC 400xP and DECpc 400ST series platforms **only**.

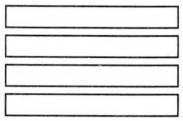
Step 4—Memory

Systems include 4 Mbytes of memory with maximum expansion to 192 Mbytes. Main logic board accommodates two memory banks, two slots per bank. Optional memory expansion card accommodates four banks, two slots per bank for a system total of 12 memory slots. SIMMs MUST be installed in pairs of matching size and speed.

Some memory configurations require removal of two 2-Mbytes SIMMs standard in all systems.

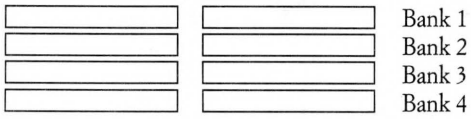
Digital recommends a minimum of 4 Mbytes of memory on systems using MS-DOS and Microsoft Windows, 4 Mbytes for OS/2 operating systems, and 8 Mbytes for SCO UNIX operating systems. An additional 0.5 Mbyte is recommended on SCO UNIX systems for each concurrent user, or each additional graphical application.

System memory board



(PS2XM-AA standard in all systems)

Optional memory expansion card (PCTXM-AA)



PS2XM-AA	4 Mbytes (2 × 2-Mbytes, 80 ns, 36-bit SIMM kit)
PS2XM-AB	8 Mbytes (2 × 4-Mbytes, 80 ns, 36-bit SIMM kit)
PS2XM-AC	16 Mbytes (2 × 8-Mbytes, 80 ns, 36-bit SIMM kit)
PS2XM-AD	32 Mbytes (2 × 16-Mbytes, 70 ns, 36-bit SIMM kit)
PS2XM-AE	Memory expansion card; maximum of one expansion card per system

Note: If factory installation is selected, two additional SIMM kits ordered without memory expansion card require removal of standard 4-Mbyte (2 × 2 Mbytes) SIMMs. These SIMMs will be shipped to customer for future upgrades.

Step 5—External Cache Upgrade (Optional)

External cache upgrades are supported on 25-MHz and 33-MHz systems only. Maximum of one upgrade kit per system.

PSWXM-AA	64-Kbyte external cache upgrade kit
PSWXM-AB	128-Kbyte external cache upgrade kit

Step 6—Storage (Optional)

System includes one 1.44-Mbyte 3.5-inch diskette drive. Seven additional half-height storage bays or three full-height and one half-height are available (three accessible, four hidden). SCSI devices require a controller; see Step 6a. Select additional devices if required.

Minimum fixed disk storage recommended for operating systems:

MS-DOS	40 Mbytes
OS/2	40 Mbytes
SCO UNIX	80 Mbytes + 5 Mbytes per user (typical for office environment)

Select maximum of one additional 1.2-Mbyte 5.25-inch diskette drive, internal cabling included with base system.

PS20R-FA	1.2-Mbyte 5.25-inch half-height diskette drive	One bay

Select maximum of two IDE fixed disks, IDE controller standard on base system. Requires selection of internal IDE cable; cable harness assembly supports two drives. IDE drives not recommended for use with SCO UNIX.

PCWXR-BB	105-Mbyte 3.5-inch 25-mm half-height IDE disk drive	One bay
PSWXR-AA	Internal IDE cable for applicationDEC 400xP	

SCSI devices require SCSI controller from Step 6a.

PS20R-AA	245-Mbyte 3.5-inch 42-mm half-height SCSI hard drive	One bay
PS20R-BA	426-Mbyte 3.5-inch 42-mm half-height SCSI hard drive	One bay
PS20R-CA	665-Mbyte 5.25-inch full-height SCSI disk drive	Two bays
PCXAR-AC	852-Mbyte 3.5-inch half-height SCSI hard drive	One bay
PS20R-DA	1-Gbyte 5.25-inch full-height SCSI disk drive	Two bays
PS20R-HA	1.3-Gbyte 5.25-inch full-height SCSI disk drive	Two bays
PS20R-EA	320/525-Mbyte 5.25-inch half-height QIC tape	One bay
TLZ06-BA	4.0-Gbyte 3.5-inch half-height digital audio tape (DAT)	One bay

Step 6a—SCSI AHA Controllers

One controller per seven SCSI devices under SCO UNIX 3.2.4. SCSI devices are not recommended for OS/2 V1.21 systems. Controllers include internal SCSI cable and terminations.

PSXAZ-AA	AHA 1520 SCSI controller (8-bit)
PSXAZ-CA	AHA 1540B SCSI controller (16-bit)
PSXAZ-BA	AHA 1740A SCSI controller (32-bit bus master); requires external SCSI cable (BC09D-03)

Step 6b—External Storage

Systems support two SCSI controllers. Maximum of two tower storage expanders per system. Maximum of two expansion boxes per SCSI controller, four expansion boxes with two SCSI controllers. External SCSI cable must not exceed 6 meters (19.7 feet).

Note: xA variants include 120-V power cord; x3 require country-specific power cord.

Step 6b—External Storage *(Continued)*

Tower Storage Expansion
Select maximum of two tower storage cabinets. Select SCSI devices for tower from Step 6.

- 14 half-height bays (four front accessible bays)
- Half-height bays convertible to full-height
- Internal cabling for two SCSI bus and two external SCSI cables
- Maximum of seven SCSI devices per bus under SCO UNIX 3.2.4.
- Each bus requires one SCSI controller in host system
- 350-W autosensing power supply
- AHA 1740A SCSI controller (PSXAZ-BA)
- External SCSI cable BC09D-03

Tower Expansion
SCSI devices ordered with PS2XR-AA/A3 are factory installed.

PS2XR-AA/A3	14-bay tower storage expander, SCSI options factory installed
PS2XR-BA/B3	14-bay tower storage expander, SCSI options field installable

Step 7—I/O Cards (Optional)

Base system has eight 32-bit EISA slots: six bus master, two slave.

- No configuration restriction on filling backplane (with exception of 32-bit bus master card in slots 3–8 only)
- Select maximum of eight total I/O cards
- Select maximum of six 32-bit EISA bus-master cards

Option card types accepted per slot type:	**Slave (Slots 1 and 2)**	**Master (Slots 3–8)**
AT (8-bit)	Yes	Yes
ISA (16-bit)	Yes	Yes
ISA master (16-bit)	Yes	Yes
EISA slave (32-bit)	Yes	Yes
EISA (32-bit) bus master	No	Only

Step 7a—Terminal Multiplexer Options

Multiplexer card:

- Each multiplexer board supports one to four terminal concentrators.
- Based on memory configuration, system will support the following number of multiplexer cards under SCO UNIX 3.2.4:

Less than 16 Mbytes:	Maximum of 1 MUX (limit 32 users)
16 Mbytes or greater:	Maximum of 4 MUX (limit 128 users)

Terminal concentrators:

- Each terminal concentrator supports one to eight asynchronous devices such as terminals and printers.
- Supports full modem control.
- Supports serial printers which require hardware handshakes.
- Maximum of three additional terminal concentrators per MUX kit (PC4XD-DA).

Extension kit:

- An extension kit is available if terminal concentrator is to be placed more than 3 meters (10 feet) from system box.
- Allows terminal concentrator to be placed up to 305 meters (1,000 feet) away from system.
- Includes wall-mounted power supply. **Note:** Cable is not available from Digital; customers need to purchase a level 3 or 4 unshielded twisted-pair cable at the desired length.
- Requires SCO UNIX 3.2.4.

PC4XD-DA	Terminal multiplexer (16-bit card) with one 8-port terminal concentrator
PC4XD-DB	8-port terminal concentrator
PC4XD-DC	Terminal concentrator extension

Step 7b—Ethernet Cards

3C503	3Com—reference sell only
WD8013	Western Digital—reference sell only

Step 7c—Internal Modem Card

PC4XD-CA	2400-baud internal modem (16-bit)

Step 8—Console Monitors

Note: The EISA System Configuration Utility requires VGA (standard with system), VGA monitor, and a PC keyboard. A serial I/O terminal cannot be used as a console device to configure the system. 120-V monitors include power cord; select country-specific power cords for 240-V variants from Step 2.

VRT13-CA	13-inch VGA, color, 120-V power cord included
VRT13-DA	13-inch VGA, color, 240 V, requires country-specific power cord
PC4XV-A2	14-inch VGA, monochrome, 120-V power cord included
PC4XV-A3	14-inch VGA monochrome, 240-V Northern Hemisphere, requires country power cord
PC4XV-A4	14-inch VGA monochrome, 240-V Southern Hemisphere, requires country power cord
VRC16-DA	16-inch multisynchronous, color, 120-V power cord included
VRC16-D3	16-inch multisynchronous, color, 240-V Northern Hemisphere, requires country power cord
VRC16-D4	16-inch multisynchronous, color, 240-V Southern Hemisphere, requires country power cord

Step 9—Keyboard

PCXAL-AA	U.S. keycaps—101 keys
PCXAL-AB	Belgian keycaps—102 keys
PCXAL-AD	Danish keycaps—102 keys
PCXAL-AE	U.K. keycaps—102 keys
PCXAL-AG	German keycaps—102 keys
PCXAL-AI	Italian keycaps—102 keys
PCXAL-AN	Norwegian keycaps—102 keys
PCXAL-AP	French keycaps—102 keys
PCXAL-AR	Spanish (international) keycaps—102 keys
PCXAL-AS	Spanish keycaps—102 keys
PCXAL-AT	Hebrew keycaps—102 keys
PCXAL-AV	Portuguese keycaps—102 keys
PCXAL-CA	Swedish/Finnish keycaps—102 keys
PCXAL-CH	Swiss keycaps—102 keys

Step 10—Accessories

Hardware-specific accessories for applicationDEC 400xP

PSWXM-BA	512-Kbyte video RAM upgrade to 1 Mbytes, 256 color, for applicationDEC 400xP
PCXAS-AA	3-button Logitec mouse
PSWXR-BA	Internal IDE cable for two IDE fixed disks
PSXAZ-DA	Internal SCSI cable, 7-connector, for use with third-party SCSI controllers; not required if DEC SCSI controllers selected
BC09D-03	External SCSI cable for 1740A SCSI controller (PSXAZ-BA)

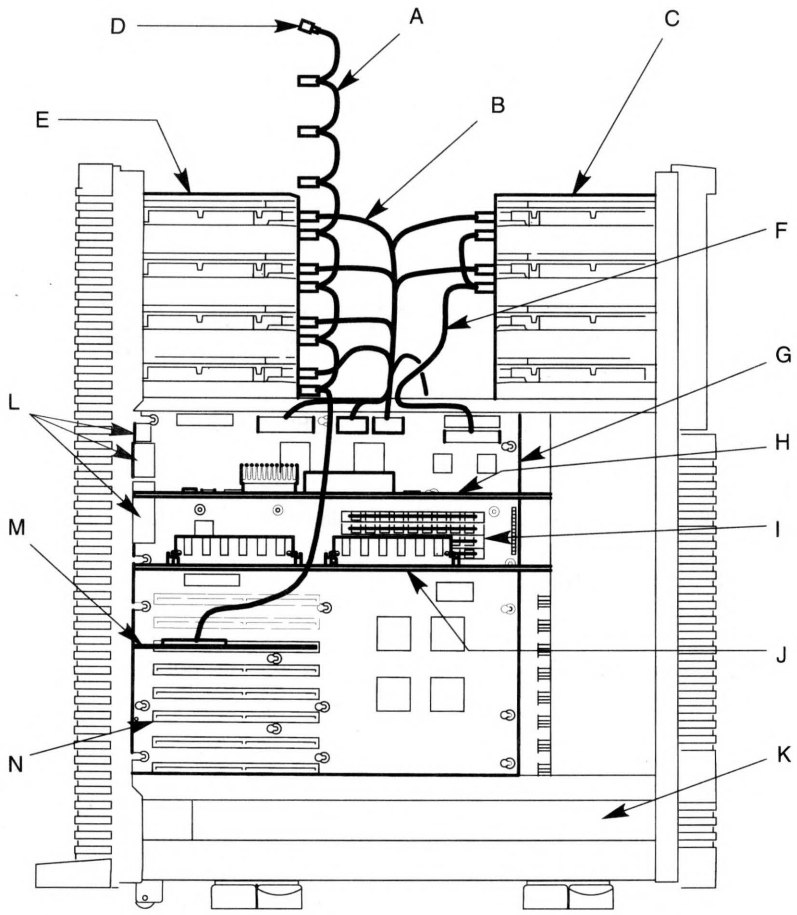
Supported Terminals and Printers

- VT420, VT330, VT340 and industry-standard terminals are supported for connection to the multiplexer, not as a system monitor
- LA70 dot matrix impact personal printer
- LA324 dot matrix impact, wide-carriage printer
- LN05/LN06 DEClaser printers
- Serial and parallel variants
- Industry-standard printers

Specifications

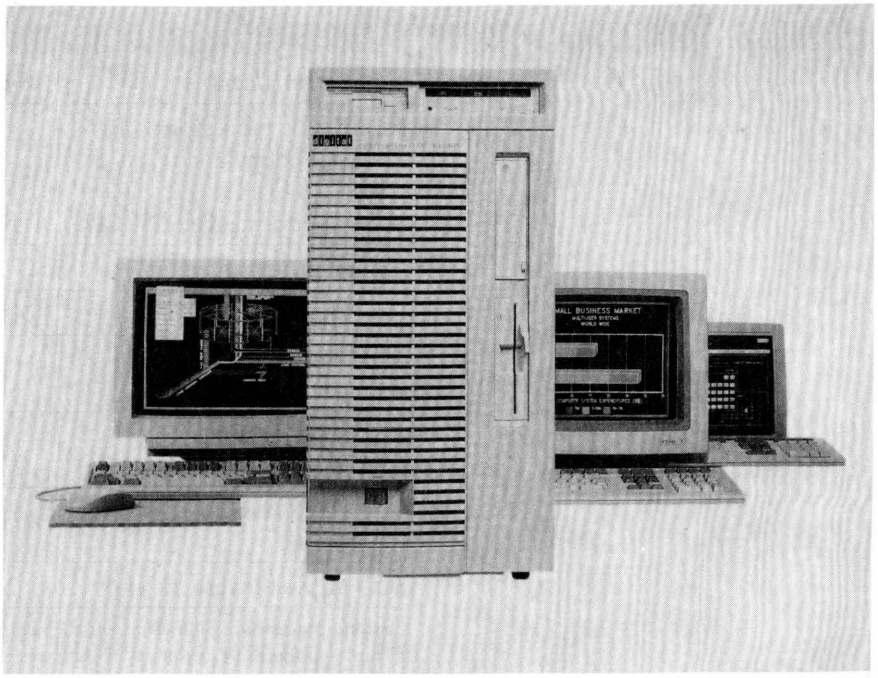
Power Requirements	Line voltage	110 V–120 V/220 V–240 V autosense
	Voltage tolerance-RMS	88 V–132 V/176 V–264 V
	Frequency/single phase	50/60 Hz
	Frequency tolerance	47 Hz – 63 Hz
	Maximum running current	12 A @ 100 Vac (with auxiliary output) 9 A @ 100 Vac (without auxiliary output)
	Maximum power consumption	830 W
Operating Environment	Temperature	10° C – 40° C (50° F – 104° F)
	Relative humidity	20–80% operating
	Maximum operating altitude	10,000 ft.
Physical Characteristics	Height	63.5 cm (25.0 in.)
	Width	22.9 cm (9.0 in.)
	Depth	61.0 cm (22.0 in.)
	Weight	26.6 kg (59 lbs) without options
Regulatory	FCC A VDE B PTT UL/CSA TUV/GS CISPR A	

System Diagram



A	SCSI bus cable
B	Power cables
C	Front drive bays
D	SCSI terminator
E	Rear drive bays
F	Diskette drive cable
G	System board
H	CPU model
I	On-board memory SIMMs
J	Memory expansion module
K	Power supply
L	I/O connectors
M	SCSI host adapter
N	EISA option module slots (8)

applicationDEC 433MP System



Product Description

The applicationDEC 433MP system is based on industry-standard technology: SCO UNIX System V with Intel 486 33-MHz processors, EISA bus, and SCSI devices. It features a dual-bus architecture: a high-performance system bus (9 slots) for CPU and memory, and an industry-standard EISA bus (7 slots) for popular PC option boards. The system software is based on SCO UNIX System V with SCO MPX multiprocessor extensions, providing immediate access to over 4,000 small-to-medium business applications.

The applicationDEC 433MP can be configured to support a variety of compute environments, e.g., multiuser timesharing system, applications fileserver, or database server. It will support one to four Intel 486 33-MHz CPU boards. Optional CPU boards also include either serial I/O or high-performance SCSI functionality. With these expansion options, terminals and storage can directly access the system bus for performance-sensitive situations.

Memory is expandable from 8 to 64 Mbytes in 4-Mbyte increments. Internal storage can grow to 5.1 Gbytes with six 852-Mbyte RZ35 disks, while external storage can grow to 14 Gbytes with 14 RZ57 disks. Storage options also include an internal 320/525-Mbyte TZK10 QICtape drive.

Configurations

The following are typical models that can be configured to meet the appropriate application environment.

Multiuser Timesharing (32-user)

- Base System (8 Mbytes, 245-Mbyte disk, VGA, 3.5-inch diskette)
- Monitor and PC keyboard
- One additional 245-Mbyte disk drive
- One terminal multiplexer kit
- One 320/525-Mbyte QICtape drive
- Additional 12-Mbyte memory (20 Mbytes total)
- SCO UNIX System V/386
- Three additional terminal concentrators

File Server

- Base System (8 Mbytes, 245-Mbyte disk, VGA, 3.5-inch diskette)
- Monitor and PC keyboard
- Two additional 245-Mbyte disk drives
- One 33-MHz 486 SCSI CPU module
- One 320/525-Mbyte QICtape drive
- One 3Com or Western Digital Ethernet module
- Additional 8-Mbyte memory (16 Mbytes total)
- Open Desktop (includes SCO TCP/IP and SCO NFS)
- Open Desktop Server Upgrade

Multiuser Timesharing Environment Examples

Number of Users	8-User	32-User	64-User	128-User
Number of processors:	1	1	2*	4†
Base CPU (included)	1	1	1	1
Serial I/O CPU	N/A	N/A	N/A	2
High-performance SCSI CPU	N/A	N/A	1	1
Minimum total memory	8	20	36	64
Disk storage	245 MB	490 MB	986 MB	2 GB
Multiplexer board with terminal concentrator	1	1	2	2
Additional terminal concentrators	N/A	3	6	14
SCO UNIX System V O/S (multiuser)	1	1	1	1
SCO MPX software kit	N/A	N/A	1	3

* Second processor in 64-user system is a high-performance SCSI CPU.
† Third and fourth processors in 128-user system are serial I/O CPUs.

File Server and Multiuser Workstation Environments

Memory Guidelines

SCO UNIX operating system or Open Desktop	8.0 Mbytes
For each concurrent user, or each additional graphical application	0.5 Mbyte
For each concurrent user in a software development environment	0.75 Mbyte
For each user running SCO UNIX VP/ix for MS-DOS under UNIX	1.0 Mbyte
For each copy of SCO MPX	4.0 Mbytes

Disk Storage Guidelines

Disk storage requirements are heavily dependent upon the type of applications being run and on the number of users.

Non-Cumulative:

SCO UNIX operating system	80 Mbytes
For each user in an office environment	5 Mbytes
For Open Desktop (total)	100 Mbytes
For Open Desktop Server Upgrade (total)	180 Mbytes
For SCO UNIX development system (total)	140 Mbytes
For SCO MPX	5 Mbytes

Cumulative:

Page/swap space	Total memory + 2 Mbytes
For each software developer	Size of source and object modules

applicationDEC 433MP hardware is customer installable. There are two methods of ordering/configuring these systems.

1. Order packaged system and options as line items—customer installs the options.
2. Order base system and options, with hardware options factory-installed and tested (hardware options ordered in Steps 1 through 10 will be factory-installed). Software options arrive at the same time, but are not pre-installed.

Step 1—Systems

Select from Steps 1 through 12, using the configuration rules noted within the Steps. Only Steps 1 through 5 are required for a fully functional system—the other steps are optional.

Step 1a—Packaged System and Options as Field Installed Line Items

PS11A-AA/A3

Packaged system includes:

- Intel 486 33-MHz base/bridge CPU (2-board set)
- 8 Mbytes of ECC memory
- RZ24L 245-Mbyte internal SCSI disk drive
- RX23 1.44-Mbyte SCSI diskette drive
- Tower box with EISA backplane
- 550-watt autosensing power supply
- Nine system bus slots for CPU and memory modules (six available for expansion)
- Seven EISA slots for popular PC option boards (four for expansion)
- Adaptec SCSI controller
- 16-bit VGA plus adapter (1024 × 768), with 3-button bus mouse
- Serial/parallel board with one serial port and one parallel port
- English-language user documentation

Step 1b—Custom System and Options, with Hardware Options Factory-Installed

Custom systems include:

- Intel 486 33-MHz base/bridge CPU (2-board set)
- A choice of 8, 12, or 16 Mbytes of ECC memory
- RZ24L 245-Mbyte internal disk drive
- RX23 1.44-Mbyte diskette drive
- Tower box with EISA backplane
- 550-watt autosensing power supply
- Nine system bus slots for CPU and memory modules (six available for expansion)
- Seven EISA slots for popular PC option boards (four for expansion)
- Adaptec SCSI controller
- 16-bit VGA plus adapter (1024 × 768), with 3-button bus mouse
- Serial/parallel board with one serial port and one parallel port
- English-language user documentation

System	Number of CPUs	Memory	Disk Storage	Diskette Drive	Tape Drive
PS110-AA/A3	1	8 MB	245 MB	1.4 MB	N/A
PS110-BA/B3	1	8 MB	245 MB	1.4 MB	320/525 MB
PS110-DA/D3	1	16 MB	245 MB	1.4 MB	320/525 MB

Step 2—Power Cord (System to wall socket—not required for 120-V systems)

If a 240-V system is required, appropriate power cords must be ordered.

BN26J-1K	United States/Canada/Japan, 120 V (included in base -AA system)
BN24R-2E	Australia/New Zealand
BN19W-2E	Austria, Belgium, France, Holland, Norway, Sweden, Portugal, Spain
BN26B-2E	U.K./Ireland
BN24T-2E	Switzerland
BN19K-2E	Denmark
BN22P-2E	Israel
BN19Z-2E	Italy
BN22Z-2E	India

Step 3—Operating System Software

Software order numbers include license, media, and documentation.

Note: SCO UNIX, SCO MPX, and Open Desktop, as sold by Digital Equipment Corporation, include SCO patches and enhancements to improve data reliability and performance. To ensure reliable operation, customers should only use SCO UNIX, SCO MPX, and Open Desktop available from Digital on the application DEC family of systems. (Digital Equipment Corporation only supports SCO UNIX System V, SCO MPX, and Open Desktop kits that have been provided by Digital Equipment Corporation.)

In U.S. and Canada:

QB-YN2AW-VA	SCO UNIX two-user, 3.5-inch diskette media
QB-YN2AW-VD	SCO UNIX two-user, QICtape media
QB-YN2AW-VB	SCO UNIX multiuser, 3.5-inch diskette media
QB-YN2AW-VE	SCO UNIX multiuser, QICtape media
QB-GF1AW-VA	SCO UNIX Developers' System, 3.5-inch diskette media—requires two-user or multiuser media
QB-YN8AW-VB	Open Desktop operating system, QICtape drive media
QB-GF4AW-VA	Open Desktop Server Upgrade, 3.5-inch diskette media—requires Open Desktop O/S
QB-GF5AW-VB	Open Desktop Development System, QICtape media—requires Open Desktop O/S
QB-YNBAW-VC	DEC Enhanced SCO MPX V1.2 3.5-inch diskette media

In GIA:

QB-YN2AW-VG	SCO UNIX two-user 3.5-inch diskette media
QB-YN2AW-VH	SCO UNIX multiuser 3.5-inch diskette media
QB-GF1AW-VJ	SCO UNIX Developers' System, 3.5-inch diskette media—requires two-user or multiuser media
QB-YN2AW-VK	SCO UNIX two-user QICtape media
QB-YN2AW-VL	SCO UNIX multiuser QICtape media
QB-YN8AW-VK	Open Desktop operating system QICtape media
QB-GF4AW-VH	Open Desktop Server Upgrade, 3.5-inch diskette media—requires Open Desktop O/S
QB-GF5AW-VM	Open Desktop Development System, QICtape media—requires Open Desktop O/S
QB-YNBAW-VD	DEC Enhanced SCO MPX V1.2 3.5-inch diskette media

Notes:
- SCO MPX is required for a 2-CPU system, and for each additional processor added.
- Refer to SPDs for more information.
- Open Desktop operating system is a prerequisite for Open Desktop Server Upgrade and/or Open Desktop Development System.

Step 4—Video Monitor

Select a video display monitor.

Note: The EISA configuration utility, a software utility for configuring EISA systems, requires a VGA (standard in base system), a monitor, and a PC keyboard—a serial I/O terminal cannot be used as a console device to configure the system. Multiple VGE boards in a system are not supported.

VRC16-DA	16-inch color multisync video display, 120 V (includes power cord)
VRC16-D3	16-inch color multisync video display, 240 V (order country cord from Step 2)
VRC16-D4	16-inch color multisync video display, 240 V, S. Hemisphere (order country cord from Step 2)
VRT13-CA	14-inch color video display, 120 V (includes power cord)
VRT13-DA	14-inch color video display, 240 V (order country cord from Step 2)
PC4XV-A2	14-inch monochrome video display, 120 V (includes power cord)
PC4XV-A3	14-inch monochrome video display, 240 V (order country-specific power cord)
PC4XV-A4	14-inch monochrome video display, 240 V, S. Hemisphere (order country-specific power cord)

Step 5—Keyboards

PCXAL-AA	U.S. keycaps (101 keys)
PCXAL-AB	Belgian keycaps (102 keys)
PCXAL-AD	Danish keycaps (102 keys)
PCXAL-AE	U.K. keycaps (102 keys)
PCXAL-AG	German keycaps (102 keys)
PCXAL-AI	Italian keycaps (102 keys)
PCXAL-AN	Norwegian keycaps (102 keys)
PCXAL-AP	French keycaps (102 keys)
PCXAL-AR	Spanish (international) keycaps (102 keys)
PCXAL-AS	Spanish keycaps (102 keys)
PCXAL-AT	Hebrew keycaps (102 keys)
PCXAL-AV	Portuguese keycaps (102 keys)
PCXAL-CA	Swedish/Finnish keycaps (102 keys)
PCXAL-CH	Swiss keycaps (102 keys)
PCXAL-CT	German-ampersand keycaps (102 keys)

Step 6—CPU and Memory Options

Order additional processors and memory as required for the application environment.

The nine system bus slots are allocated as follows:

- One for base 486 CPU board
- One for bridge CPU board (bridge EISA bus to system bus)
- One for memory board
- Six available for additional CPU or memory boards

Step 6a—CPU Options

One to three incremental 486/serial I/O CPUs can be added to a base system. The 33-MHz 486/SIO processor board includes a built-in serial I/O multiplexer which supports one to four terminal concentrators.

PS10K-AA	33-MHz i486 SIO CPU module

Note: SCO MPX is required for a 2-CPU system, and for each additional processor added.

To optimize disk I/O performance, the 486 SCSI CPU should be the first optional CPU added to the base system. A maximum of two 486/high-performance SCSI controllers are supported on the system bus. The first 486 SCSI CPU supports a combination of internal and external devices. The second 486 SCSI CPU supports external devices. Each 486 SCSI CPU supports up to seven disk drives.

PS10K-BA	33-MHz i486 SCSI CPU module

Note: SCO MPX is required for a 2-CPU system, and for each additional processor added.

Step 6b—Memory Options

One to three incremental system bus memory boards can be added to a base system for a maximum total of four memory boards. The base system memory board includes 8 Mbytes of memory—additional memory SIMMs can be added in 4-Mbyte increments up to a total of 16 Mbytes. Each additional memory board can accommodate 16 Mbytes. The maximum total memory is 64 Mbytes on four memory boards.

PS1XM-BA	4-Mbyte SIMM package, ECC, 100 ns
PS1XM-AA	Add on ECC memory card (no SIMMs)
PS1XM-BB	100-Mbyte memory pack (25 × 4-Mbyte SIMM packages)

Note: The bulk-ordering PS1XM-BB is offered as an ease-of-ordering/pricing feature when ordering multiple systems—the 64 Mbytes total per system applies.

Step 7—Internal Storage Options

Select additional storage devices if required.

System supports one to six RZ24L or RZ25 SCSI disks. If an RX33 5.25-inch diskette drive is installed, a total of five RZ24L/RZ25 disks can be installed.

Note: When ordering base system and options with hardware options pre-installed, select factory-installed options.

System supports the following SCSI controllers:

- Adaptec (ISA bus) PS1XR-AA—for external and internal devices
- A second (ISA bus) PS1XR-AA—for tape drive only
- 486 SCSI (system bus) PS10K-BA—for internal and external devices
- A second 486 SCSI (system bus) PS10K-BA—for external devices

Note: The first PS1XR-AA (included in Base System) supports up to four disk drives. Each 486 SCSI CPU supports up to seven disk drives.

RX33-AS	1.2-Mbyte 5.25-inch diskette disk drive
RZ24L-SJ	245-Mbyte disk drive (factory installed)
RZ24L-SJ	245-Mbyte disk drive (field installable)
RZ25-SJ	426-Mbyte disk drive (factory installed)
RZ25-SH	426-Mbyte disk drive (field installable)
PCXAR-AC	852-Mbyte disk drive (factory/field installed)
TZK10-EF	320/525-Mbyte QICtape drive (factory installed)
TZK10-EG	320/525-Mbyte QICtape drive (field installable)
TLZ06-EF	4.0-Gbyte 4-mm digital audio tape (DAT) drive (factory installed)
TLZ06-EG	4.0-Gbyte 4-mm digital audio tape (DAT) drive (field installable)

Step 8—Multiuser Options

Select multiplexer kits and terminal concentrators to accommodate the number of users.

System supports up to three EISA-bus terminal multiplexer boards. Each mux board supports one to four terminal concentrators. Each terminal concentrator supports one to eight asynchronous devices such as terminals and printers. Also supports up to three system bus serial I/O CPU modules.

A terminal concentrator plugs into either an EISA-bus mux board or a 486 SIO CPU board. The terminal concentrator supports full modem control. It also supports serial printers which require hardware handshakes. An extension kit is available if a terminal concentrator is to be placed more than 3 meters (10 feet) from the applicationDEC system box. The extension kit allows the terminal concentrator to be placed up to 305 meters (1000 feet) away from the system. The extension kit includes a wall-mounted power supply. Cable is not available from Digital; customers need to purchase a level 3 or 4 unshielded twisted-pair cable at the desired length.

PC4XD-DA	Terminal multiplexer kit (includes PCAXD-DB, cables and adapters; accepts three additional PC4XD-DB terminal concentrators)
PC4XD-DB	Terminal concentrator, with full modem control
PC4XD-DC	Terminal concentrator extension kit (120 V)

Step 9—Application/Environment Software

Select SCO UNIX application software. Software order numbers include a license, media, and user documentation.

In U.S. and Canada:

QB-YN7AW-VA	SCO TCP/IP Runtime System, 3.5-inch diskette media
QB-GF2AW-VA	SCO TCP/IP Developer's System, 3.5-inch diskette media (requires SCO TCP/IP runtime media)
QB-GF3AW-VA	SCO NFS, 3.5-inch diskette media
QB-GF6AW-VA	SCO Portfolio, 3.5-inch diskette media
QB-GF7AW-VA	SCO Lyrix, 3.5-inch diskette media
QB-YNAAW-VA	XENIX Tutor (DOS) V1.0

In GIA:

QB-YN7AW-VD	SCO TCP/IP Runtime System, 3.5-inch diskette media
QB-GF2AW-VE	SCO TCP/IP Developer's System, 3.5-inch diskette media (requires SCO TCP/IP runtime media)
QB-GF3AW-VF	SCO NFS, 3.5-inch diskette media

Step 10—External Storage Expansion

Select a maximum of two SCSI PS2XR Expander(s).

PS2XR Expander Rules

- PS2XR Expander has seven full-height or 14 half-height storage bays; two full-height or four half-height front accessible bays support removable media; tape or SCSI diskette drives.
- Each PS2XR expander includes 18-inch SCSI cable.
- PS2XR Expanders include 120-V power cord. PS2XR Expanders for 240-V systems require country-specific power cord, see Step 2.
- PS2XR Expander ships without drives.

PS2XR-AA	SCSI Storage Expander without drives 120 V (factory installed)
PS2XR-BA	SCSI Storage Expander without drives 120 V (field installable)
PS2XR-A3	SCSI Storage Expander without drives 240 V (factory installed)
PS2XR-B3	SCSI Storage Expander without drives 240 V (field installable)

Step 10a—Storage Devices

Devices for PS2XR Expander are customer installable, or may be installed by Digital Services.

- Hard drive variants listed here are configured to spin on power-up to meet the applicationDEC 433MP SCO UNIX drive configuration requirements.

RZ24L-SJ	245-Mbyte half-height disk drive (factory installed)
RZ24L-SJ	245-Mbyte half-height disk drive (field installable)
RZ25-SJ	426-Mbyte half-height disk drive (factory installed)
RZ25-SH	426-Mbyte half-height disk drive (field installable)
PCXAR-AC	852-Mbyte half-height disk drive (factory/field installable)
PS1XR-DA	665-Mbyte full-height (RZ56) disk drive (field installable)
PS1XR-GA	1.0-Gbyte full-height (RZ57) disk drive (field installable)
TZK10-EF	525-Mbyte half-height QIC tape (factory installed)
TZK10-EG	525-Mbyte half-height QIC tape (field installable)
TLZ06-EF	4.0-Gbyte 4-mm digital audio tape (DAT) drive (factory installed)
TLZ06-EG	4.0-Gbyte 4-mm digital audio tape (DAT) drive (field installable)

Step 11—SCO UNIX Networking Options

For networking with other UNIX systems, select the following products to interconnect applicationDEC systems to other UNIX systems supporting TCP/IP networking protocol.

QB-YN7AW-VA	SCO TPC/IP Runtime System, 3.5-inch diskette media
QB-GF2AW-VA	SCO TPC/IP Development System, 3.5-inch diskette media (requires SCO TCP/IP runtime O/S)
QB-GF3AW-VA	SCO NFS, 3.5-inch diskette media

Note: The above options require a supported Ethernet card (Western Digital WD8003E or 3COM 3C503) or asynchronous serial line.

For DECnet-based systems (VAX VMS, ULTRIX, MS-DOS, Macintosh, OS/2), DECnet for SCO UNIX is currently shipping for applicationDEC systems. DECnet for SCO UNIX is a DECnet Phase IV end-node implementation. DECnet will allow the concurrent use of DECnet and TCP/IP on the same machine using a single supported Ethernet card.

QL-GJ7AW-AA	DECnet for SCO UNIX license
QA-GJ7AA-HC	DECnet for SCO UNIX media (3.5-inch diskette) and documentation
QA-GJ7AA-H7	DECnet for SCO UNIX media (5.25-inch diskette) and documentation
QA-GJ7AB-HC	DECnet for SCO UNIX Programmers Library (3.5-inch diskette)
QA-GJ7AB-H7	DECnet for SCO UNIX Programmers Library (5.25-inch diskette)
DE200-AC	DEC EtherWORKS TURBO Ethernet board (when running DECnet for SCO UNIX)

Note: The following third-party Ethernet boards are supported: Western Digital WD8003E or 3Com 3C503.

An alternative method of networking VAX VMS to applicationDEC systems is to include the Digital software product VMS ULTRIX Connection or Fusion TCP/IP which provide TCP/IP support under VMS. Both products are available from Digital. The above mentioned SCO TCP/IP product is required on the applicationDEC system.

LAT support on applicationDEC systems is available from third-party vendors. Announce-One for SCO from phase2 networks corporation provides LAT capabilities on SCO UNIX.

With IBM systems, many third-party products exist to integrate applicationDEC systems into an IBM environment. Refer to the *SCO System V Directory* for more information.

As PC LAN Server, PC-Interface from Locus Computing Corporation converts an applicationDEC system into a PC LAN server, providing extensive network services for MS-DOS personal computers.

Step 12—Accessories

Uninterruptible Power System (UPS)

Uninterruptible power systems are especially important for applications requiring continuous uptime. Digital strongly recommends the use of UPS to protect valuable data from inconsistencies caused by blackouts, brownouts, power sags, or electrical impulses.

4N-AEAAF-AF	1500 VA online backup power system. Constant line monitoring capability with surge and transient protection and battery backup.

Supported Terminals and Printers

- VT420, VT330, VT340, and industry-standard terminals are supported for connection to the multiplexer or I/O CPU, not as a system monitor.
- LA70 dot-matrix impact personal printer
- LA324 dot-matrix impact, wide-carriage printer
- LN05/LN06 DEClaser printers
- Serial and parallel variants
- Industry-standard printers

Step 12—Accessories *(Continued)*

Documentation

EK-PS110-RC	Using the 433MP System (included with Base System)
EK-PS110-OV	System Overview (included with Base System)
EK-PS110-CG	Technical Configuration and Installation Guide (included with Base System)
EK-PS110-SV	Service Guide

SCO Documentation Sets

QA-YN2AB-GZ	SCO UNIX V/386 O/S documentation set
QA-GF1AA-GZ	SCO UNIX V/386 O/S developers' system documentation set

Mouse

PS1XS-AA	3-button bus mouse (included in PS1XG-AA VGA adapter and in base system)

VRC16 Video Cable

BC13L-10	10-foot (3-meter) video cable for VRC16 monitor (included in VRC16-xx monitor)

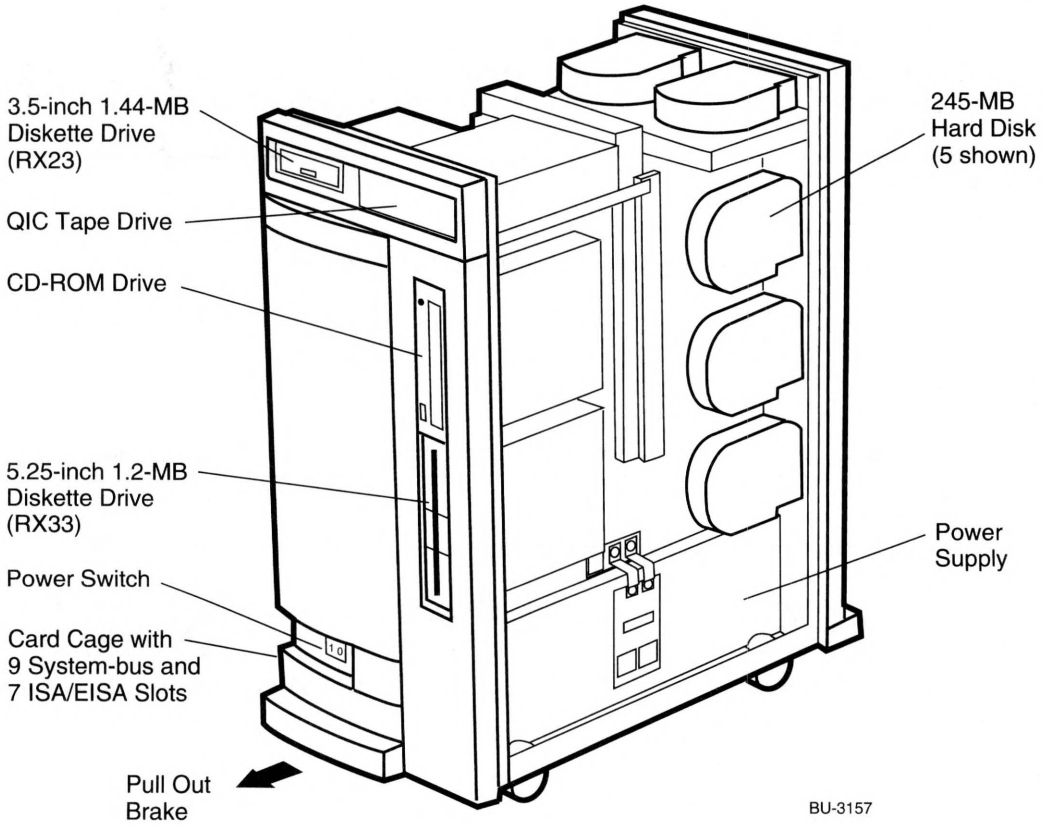
Grommet/Screw Fastener

12-31734-01	Fastens third-party internal hard disks to applicationDEC 433MP chassis brackets (orderable through the *DECdirect* catalog)

Step 13—Upgrade Kit

To upgrade an ISA-bus applicationDEC 433MP to an EISA-bus applicationDEC 433MP, order the following upgrade kit. The upgrade kit is customer installable.

PS11K-DA	Upgrade kit includes: – 33-MHz i486 EISA CPU module – EISA bridge module – 16-bit VGA-plus adapter – EISA configuration utility diskette – System Exerciser diagnostic diskette – User documentation



Slot Number		
1	Memory	System bus
2	(Optional Memory)	System bus
3	(Optional Memory)	System bus
4	(Optional Memory)	System bus
5	(Optional CPU)	System bus
6	(Optional CPU)	System bus
7	(Optional CPU)	System bus
8	EISA ←→ System Bridge	System bus
9	Base 486 CPU	System bus
10	ADAPTEC SCSI Controller	EISA bus
11	Serial/Parallel Board	EISA bus
12	VGA Module	EISA bus
13	(Optional EISA/ISA Board)	EISA bus
14	(Optional EISA/ISA Board)	EISA bus
15	(Optional EISA/ISA Board)	EISA bus
16	(Optional EISA/ISA Board)	EISA bus

BU-3156

Note:

- Base system configuration–additional modules can be added to tailor system to specific applications.

applicationDEC 433MP System Specifications

Central Processing Unit

- Intel 80486, 33 MHz uPC
- Four CPU maximum expansion
- 486 CPU with embedded SCSI
- 486 CPU with embedded SIO
- 256-Kbyte write-back cache per CPU
- 64-Mbyte system bus

Memory

- 8-Mbyte shared global memory standard
- 64-Mbyte maximum, 4-Mbyte increments
- 1-Mbyte SIMMs, 8-bit, 100-ns fast paged, ECC
- Four memory array cards maximum

Operating System and Diagnostics

- SCO UNIX System V
- DEC Enhanced SCO MPX
- Open Desktop
- DECnet for SCO UNIX
- Industry-standard ROM BIOS
- Integrated ROM-resident and standalone diagnostics

I/O Subsystem

- EISA bus, full PC/AT compatibility
- Seven EISA slots
- Two serial, one parallel ports embedded
- ISA SCSI adapter (synchronous/asynchronous)
- 16-bit VGA plus adapter, with 3-button bus mouse
- ISA expansion memory support
- Optional ISA 32-port multiplexer board
- Optional ISA Ethernet adapter
- Optional 8-port terminal concentrators

Power, Packaging, Environment

- 110/120 Vac or 220/240 Vac auto-sensing (base unit) 50–60 Hz
- 700-watt maximum power dissipation
- 12-amp line input
- Optional uninterrupted power supply
- Base system physical data
  Width: 289 mm × Depth: 559 mm × Height: 635 mm
  (Width: 11.4 in. × Depth: 22.0 in. × Height: 25.0 in.)
  Weight range: Minimum 41 kg (90.5 lb); Maximum 47 kg (104 lb)
- Integral anti-roll brake system

Agency Approvals

Safety:	Quality:	Ergonomics:
• UL	• VDE 0871-A	• TUV/GS
• CSA	• FCC Class A	
• IEC	• PTT	

Chapter 4
Specialized Systems

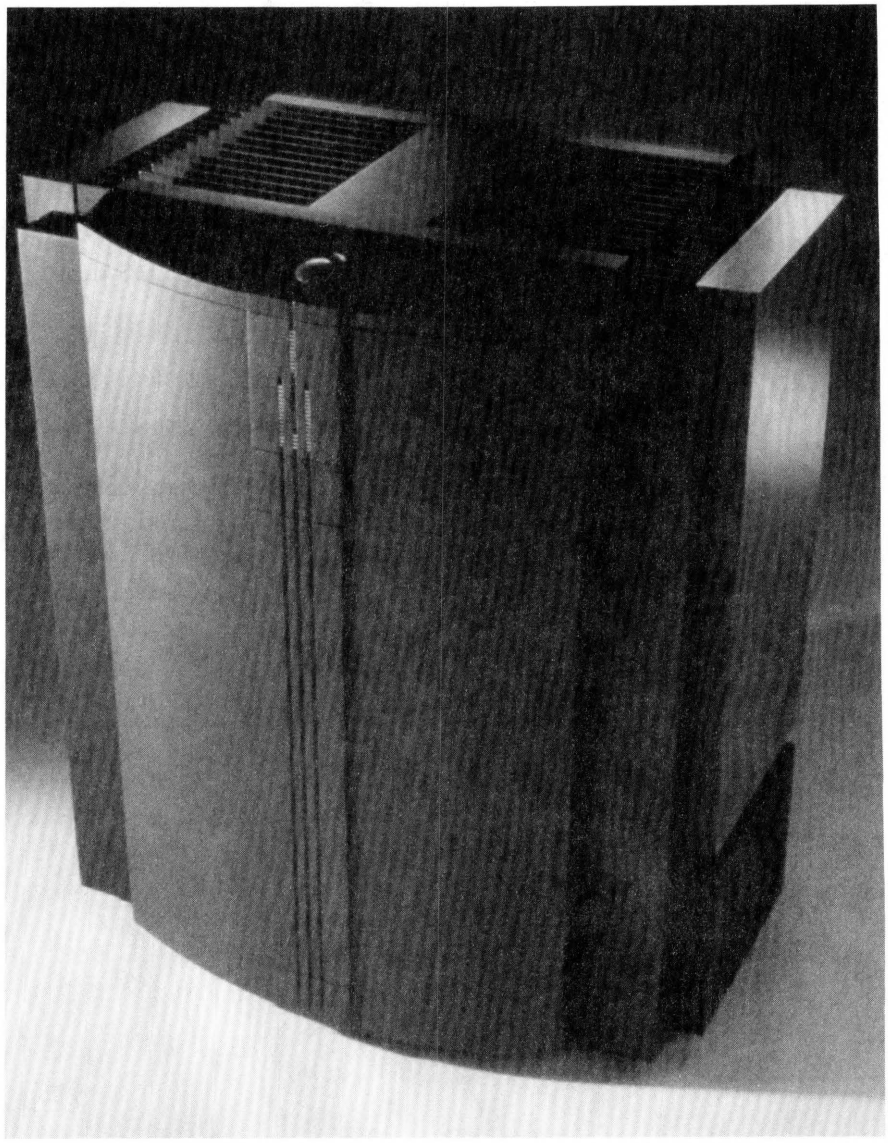
CRAY Y-MP EL System

DECmpp 12000/12000-LC Massively Parallel Processing Systems

MIRA Application Switch 3400/3800

Multiline DECvoice

CRAY Y-MP EL Systems



Product Description

The Cray Research/Digital agreement significantly expands the ongoing strategic business and technology relationship between the two leaders in the high-performance technical computing market. Customers now have access to the leading supercomputer technology of Cray Research, Inc. coupled with Digital's proven strength in open distributed computing. Together they offer the broadest range of performance and functionality with the greatest value and openness in the industry today, from desktop PCs to datacenter supercomputers. Also, over 600 optimized vector applications are available on the CRAY Y-MP EL running under UNICOS, a UNIX-based operating system. UNICOS is the most powerful and feature-rich UNIX operating system available for technical computing.

This worldwide marketing agreement reinforces all three levels of Digital's Open Advantage strategy: integrates new technology into the open Digital environment, satisfies customer needs through open business practices, and assures system reliability through Digital's open services and support programs. Cray Research products embrace the same open system standards as Digital such as X-Windows, POSIX, OSI, TCP/IP, FDDI, HIPPI and Ethernet.

Product Description *(Continued)*

The CRAY Y-MP EL system combines a proven architecture with innovations that provide the highest level of sustained performance in its price range. Using the integrated vector CRAY Y-MP architecture, each CPU provides balanced scalar, vector, memory, and I/O performance. To enhance performance while preserving binary compatibility, the CRAY Y-MP EL includes an innovative multifunctional unit extension to this architecture that provides up to four results per clock period (instead of two). To enhance performance even further, the CRAY Y-MP EL CPU is designed to maximize the overlapping of vector, scalar, memory, and I/O operations.

With up to four CPUs working in parallel and up to 1024 Mbytes of central memory, the CRAY Y-MP EL provides the highest possible performance on a wide variety of applications. Leading-edge applications are available for industries such as aerospace, automotive, chemistry, energy, petroleum, and defense. Cray Research also offers software packages to couple the power of visualization with its supercomputers.

The CRAY Y-MP EL supercomputer can be used in the following ways:

- As a departmental supercomputer—the CRAY Y-MP EL supercomputer features a powerful, balanced architecture that provides the highest possible performance in its class on scientific and engineering applications.
- As a complementary system for larger Cray Research systems—ideal for UNICOS application development. Because binaries from the CRAY Y-MP EL will run on other CRAY Y-MP systems, work is easily scaled to larger Cray Research systems.
- As a secure system—it is physically compact and offers removable storage media, and is ideal for secure processing environments. UNICOS also provides multilevel security.
- As a high-performance file server—combined with the powerful data management features of the UNICOS operating system, the CRAY Y-MP EL system is an excellent server platform. With support for standalone STK autoloading tape cartridge systems, the CRAY Y-MP EL file server can satisfy requests from multiple supercomputers over gigabit/second networks while providing service to smaller systems, workstations, and personal computers.

CRAY Y-MP EL Systems

Step 1—Systems

Select system. The following items may be required and must be purchased separately.

- Minimum configuration of disk drives
- Tape drives and other storage devices
- Network communication devices
- Additional I/O cabinets
- Processor and memory upgrades
- Layered software

Base Cray Y-MP EL system includes

- Mainframe cabinet
- One to four processors
- Four memory boards containing memory selected
- 20-slot VME I/O card cage
- I/O subsystem with 6-slot backplane
- 1.35-Gbyte QIC cartridge tape drive (for operating system backup)
- 200-Mbyte Winchester disk drive (for error logging)
- Set of user, operator, and system administrator manuals
- Operator's console
- Maintenance workstation
- Operating system software and license

Digital Order Number	Cray Order Number	Number of CPUs	System Memory
MC121-AA	Y-MP EL/1-256	1	256 Mbytes
MC131-AA	Y-MP EL/1-512	1	512 Mbytes
MC141-AA	Y-MP EL/1-1024	1	1024 Mbytes
MC122-AA	Y-MP EL/2-256	2	256 Mbytes
MC132-AA	Y-MP EL/2-512	2	512 Mbytes
MC142-AA	Y-MP EL/2-1024	2	1024 Mbytes
MC123-AA	Y-MP EL/3-256	3	256 Mbytes
MC133-AA	Y-MP EL/3-512	3	512 Mbytes
MC143-AA	Y-MP EL/3-1024	3	1024 Mbytes
MC124-AA	Y-MP EL/4-256	4	256 Mbytes
MC134-AA	Y-MP EL/4-512	4	512 Mbytes
MC144-AA	Y-MP EL/4-1024	4	1024 Mbytes

Step 2—Additional CPUs

System accommodates four CPUs; all CPU boards reside in the mainframe cabinet. If additional CPUs are required, order the following.

MC10C-AA CRAY Y-MP EL CPU Upgrade

Step 3—Memory

The CRAY Y-MP EL is a real memory, timesharing machine rather than a virtual memory machine. Selection of proper memory size is most important. Without sufficient memory, excessive process swapping may occur.

It is very important to understand the number of interactive users connected to the system, their interface environments, and the type of work being performed. X-window users may have two to three windows open at one time performing various tasks from each window. Each window is an individual process that requires system memory. In addition to interactive users, large batch jobs must be sized and taken into consideration. UNICOS itself requires 8.8 Mbytes of memory.

Step 3—Memory *(Continued)*

As an example, consider ten interactive X-terminal users who are using the system for code development. Each user is assumed to have two sessions, one for editing and one for compiling and testing. Assuming average program sizes, these 20 processes will need approximately 160 Mbytes of system memory. If the size and complexity of the programs increases, even more memory will be needed.

If additional system memory is needed, order the following options:

MC10M-AA	Cray 256- to 512-Mbyte memory upgrade
MC10M-AB	Cray 512- to 1024-Mbyte memory upgrade

Step 4—I/O Subsystems

The CRAY Y-MP EL uses a VME I/O subsystem that conforms to the IEEE-1014 industry interface standard. The standard offering is the 6U card cage which accepts VME boards that are 15.2 × 4.4 cm (6 × 1.75 inches) or 26.7 cm (10.5 inches) high. A 9U card cage that accommodates custom-built VME boards is available on special order.

The mainframe cabinet and each of the three expansion cabinets have a VME cage with 20 slots for VME boards. Into these slots go I/O systems (IOSs) which consist of an I/O processor board (IOP), an I/O buffer board (IOBB), a Y-1C channel cable that connects the VME to the I/O port of the CPU, and user VME boards. When configuring an IOS, two slots are taken for the IOP and the IOBB.

There are three types of IOSs available: the 10-, 6-, and 4-slot systems which result in 8-, 4-, and 2-user slots respectively. The VME card cage may be set up at the factory in a 6-4-6-4 (up to four I/O channels), 10-6-4 (up to three I/O channels), or 10-10 (up to two I/O channels) slot IOS configuration (see system diagrams). Unless otherwise specified on the order, the factory will build the 6-4-6-4 configuration and will make the one IOS included with the base system a 6-slot.

Each VME I/O system (IOS) is connected to the I/O port of a CPU via the Y-1C channel which has a sustainable data transfer rate of over 20 Mbytes/second. When configuring the VME I/O system, devices should be placed on I/O channels so that the sum of the data transfer rates in actual practice for the devices during peak periods of I/O do not exceed the sustained rate for the IOS channel.

If additional I/O systems are required, order the following.

MC10X-HG	Cray additional IOS with eight slots
MC10X-HH	Cray additional IOS with four slots
MC10X-HJ	Cray additional IOS with two slots

Step 5—Disk Configurations

The following is the minimum disk storage capacity required according to the amount of system memory purchased. These minimum requirements are only capable of providing adequate space to permit bringing up the operating system. They do not include customer static storage requirements or disk space for a backup root file system.

System Memory	Minimum Disk Capacity (Bytes)
256 Mbytes	1,849,780,000
512 Mbytes	2,655,080,000
1024 Mbytes	4,265,480,000

The following Cray Research disk subsystems have been selected primarily for performance and reliability with optimized device drivers, diagnostics, and error logging features.

MC10S-EA	**Cray 1.3-Gbyte (formatted) 5.25-inch Winchester ESDI Disk Drive**—operates at a peak data transfer rate of approximately 2 Mbytes/second; ESDI controller required.
MC10S-RA	**Cray 1.3-Gbyte Removable Disk Subsystem**—frame containing two ESDI drives in removable canisters used for secure operations where media must be removed between runs. ESDI controller supports two removable disk subsystems.
MC10S-RB	**Cray Spare Removable Canister**—ESDI drive in removable canister that fits the removable disk subsystem.

Step 5—Disk Configurations *(Continued)*

MC10S-RC	**Cray Maintenance Disk Drive**—frame containing one ESDI disk drive in removable canister. Replaces IOS maintenance/startup console drive and allows system to be configured entirely with removable media.
MC10S-RD	**Cray Spare Maintenance Canister**—spare ESDI drive in removable canister for maintenance disk drive.
MC10S-EB	**Cray ESDI Controller**—intelligent controller that supports four ESDI disk drives. Intelligent disk management techniques include overlapping seeks on multiple drives connected to the disk controller. Operates at peak data transfer rate of 2 Mbytes/second. Requires tray and one VME slot.
MC10X-HA	**Cray ESDI Peripheral Expansion Tray**—specially designed tray that holds eight ESDI disk drives and contains power supplies for the drives. Trays are required for all ESDI drives with the exception of removable and maintenance drives which include their own trays. Due to power supply incompatibilities, different drive types cannot be mixed in this tray.
MC10S-IA	**Cray 2.7-Gbyte (formatted) two-headed parallel IPI-2 Disk Drive**—operates at a peak formatted transfer rate of 7.5 Mbytes/second and sustained transfer rates of approximately 6 to 7 Mbytes/second.
MC10S-IB	**Cray IPI-2 Drive Controller**—intelligent controller that can transfer data from two drives simultaneously; supports four IPI-2 drives. Operates at peak data transfer rate of 15 Mbytes/second. Requires tray and one VME slot.
MC10X-HB	**Cray IPI Peripheral Expansion Tray**—holds two IPI-2 drives and contains all necessary power supplies for the drives. All IPI-2 drives require trays. Due to power supply incompatibilities, different drive types cannot be mixed in this tray.
MC10S-DA	**Cray Disk Array Storage System (DAS)** —specialized storage subsystem that transfers large blocks of sequential data rapidly. Consists of an intelligent disk array controller supporting four banks (one included) of eight ESDI drives for data storage, plus one drive for parity and error recovery and one spare drive to serve as a hot standby. Provides a sustained data transfer rate in excess of 15 Mbytes/second on block sizes of 64K and larger. For smaller block transfers, the rate drops to 0.01 Mbyte/second. As an alternative to the DAS, consider striping two 2.7-Gbyte IPI-2 disk drives to obtain close to the 15 Mbytes/second of the DAS over all block sizes. Requires one VME slot.
MC10S-DB	**Cray DAS Expansion Bank**—extra banks of ten 1.3-Gbyte drives for the DAS array.
MC10S-DC	**Cray DAS Multiplexer**—allows disk array storage system to expand beyond one bank of drives.

Step 6—Network Communications

A number of network options including Ethernet, FDDI, HYPERchannel, and HIPPI are supported. All except HIPPI are supported off the VME I/O system. Each of the following interface cards fits into one slot of the VME IOS. They all use TCP/IP protocol and support FTS (file transfer), Telnet (interactive access), NFS (network file system), and X-Windows.

MC10N-FA	Cray FDDI interface card (requires one VME slot)
MC10N-GA	Cray HYPERchannel interface card (requires one VME slot)
MC10N-RA	Cray Ethernet interface card (requires one VME slot) **Note:** UNICOS does not support directly connected terminals. An Ethernet terminal server must be purchased to supply this functionality.

HIPPI is an actual high-performance channel directly into the CPU that requires a chip change on the CPU board. HIPPI channels do not use VME slots. Once HIPPI is configured, the CPU supporting HIPPI can only support up to two IOS channels for a maximum of ten VME slots. Cray HIPPI uses TCP/IP protocol and supports FTS (file transfer) and NFS (network file server). ULTRAnet support is under investigation.

MC10N-HA	Cray HIPPI input and output channels
MC10N-HB	Cray HIPPI input channel
MC10N-HC	Cray HIPPI output channel

Step 7—Tape Configurations

All tapes, including Exabyte units, are designed to fit inside the cabinets.

MC10S-TA	**Cray 125 IPS 9-Track Pertec Tape Drive**—high-performance, digital vacuum-buffered drive for 0.5-inch open-reel tape. Read/write tape speed is 125 inches per second for 800-, 1600-, or 6250-bit/inch tape densities. Requires connection to a Pertec tape control unit.
MC10S-TD	**Cray Pertec Tape Control Unit**—supports one internal or eight external 9-track tape drives. Unit is capable of reading and writing records of any length, and reading records of unknown length. Requires one VME slot.
MC10S-TB	**Cray 3480-Compatible Cartridge Tape Drive**—provides high-speed access to 3480-compatible cartridges. Data transfer rate is 3 Mbytes/second. Each drive includes its own tray, but requires Cray SCSI-1 interface card.
MC10S-TC	**Cray SCSI-1 Interface Card**—has a transfer rate of 5 Mbytes/second; Provides connectivity to STK (or compatible) SCSI tape units such as the STK4781 which provides connectivity to the STK 4400 silo. Requires one VME slot. Also supports the 3480-compatible cartridge drives and Exabyte drives.
MC10S-TE	**Cray Exabyte 8-mm Helical Scan Cartridge Tape Drive**—consists of drive and controller integrated into a 5.5-inch form factor. Provides 5-Gbyte capacity per 8-mm cartridge and is intended primarily as a user file backup device. Transfer rate is 500 Kbytes/second. Additional units can be placed in the main I/O cabinet using the Exabyte peripheral expansion tray and SCSI-1 interface card.
MC10X-HC	**Cray Exabyte Peripheral Expansion Tray**—allows two Exabyte units to be placed in main I/O cabinet space and be connected to the VME I/O system.

Step 8—Expansion Cabinets

Select additional expansion cabinets if required.

Diagram on page 4.12 shows a front view of a typical cabinet with its right and left chimneys or vertical shafts into which storage devices and trays are installed. Each chimney has its own cooling system where air is blown from the bottom and exhausted through the top of the cabinet. Vertical space is designated in "U" units where one U equals 4.45 cm (1.75 inches).

In the mainframe cabinet, the right chimney is filled with the CPUs and memory modules, and is not available for any peripheral devices or trays. In the expansion cabinets, both chimneys may be populated with devices and trays, but restrictions apply as to what is permitted in each chimney.

Permitted in Left Chimneys	Permitted in Right Chimneys
• 1.3-Gbyte ESDI disk drives and trays	• 1.3-Gbyte ESDI disk drives and trays
• 2.7-Gbyte IPI-2 disk drives and trays	• 2.7-Gbyte IPI-2 disk drives and trays
• Exabyte drives and trays	• Exabyte drives and trays
• Pertec 9-track tape drives	
• 3480-compatible cartridge tape drives	
• 2.6-Gbyte removable disk drive systems	
• Disk Array Storage (DAS) subsystems	
• Disk Array Storage (DAS) banks	

Use the following list to determine the vertical space required for each of the currently-offered peripheral devices and peripheral expansion trays.

Order Number	Description	Space (U = 4.4 cm; 1.75 in.)
MC10X-HA	ESDI peripheral expansion tray	5U
MC10X-HB	IPI-2 peripheral expansion tray	5U
MC10X-HC	Exabyte peripheral expansion tray	2U
MC10S-RA	2.6-Gbyte removable ESDI drive system	3U
MC10S-DA	10.4-Gbyte disk array storage subsystem	
	– DAS bank	5U
	– DAS controller	8U
MC10S-DB	10.4-Gbyte disk array storage bank	5U
MC10S-TA	125 IPS 9-track Pertec tape drive	5U
MC10S-TB	3480-compatible cartridge tape drive	4U

Step 8—Expansion Cabinets *(Continued)*

Additional Configuration Rules

1. All processor and memory boards are configured in the mainframe cabinets. Additional cabinets are strictly for I/O and storage devices.
2. Maximum of two 3480-compatible cartridge tape drives, or one 9-track tape drive and one 3480-compatible drive, or one 9-track tape drive plus disks can be supported in the left chimney. Only one 9-track tape drive is supported in the left chimney due to cooling requirements for tape devices.
3. Because power and monitoring system extends from the mainframe cabinet to each of the expansion cabinets, the cabinets must be physically connected together.
4. If an expansion cabinet is added, there must be at least one IOS in that cabinet.
5. DAS controller may only be installed in the uppermost slot in the left chimney. Only one DAS controller supported in a mainframe cabinet or an expansion cabinet due to cooling requirements.
6. With a DAS controller in the left chimney, no removable ESDI drive system, 9-track tape drives, or 3480-compatible cartridge tape drives are allowed in that chimney due to cooling reasons.
7. One Exabyte tape drive can be installed at the top of the mainframe cabinet next to the system disk and the QIC tape. This unit is then connected to the master IOP. Two Exabytes can be placed in expansion cabinets.
8. The removable maintenance disk drive, if ordered, is placed in the upper position of the mainframe cabinet in place of the system disk.

If additional expansion cabinets with 20-slot VME card cages are required, order the following. Expansion cabinets include their own power systems and power cord.

MC10X-HD	Cray 1st expansion cabinet with VME cage
MC10X-HE	Cray 2nd expansion cabinet with VME cage
MC10X-HF	Cray 3rd expansion cabinet with VME cage

The following describes the type of connection and the physical plate space requirements for connecting devices external to the cabinets:

External Connections

The diagram on page 4.12 illustrates the number of access plates available for the various external interface bulkhead connectors. There are seven dedicated plates and 16 openings for external user interfaces.

The following describes the dedicated plate layout and the requirements for the 16 user-defined access plates:

Slot 1:	Operator's console	(EIA-232)
Slot 2:	Maintenance workstation	(9-pin DSUB)
Slot 3:	Ethernet connection	(DR-15)
Slot 4:	Remote alarm 1	(9-pin DSUB)
Slot 5:	Remote alarm 2	(9-pin DSUB)
Slot 6:	Remote control panel status	(15-pin DSUB)
Slot 7:	Centronics printer parallel connector	

Ethernet	One connector per plate
FDDI	One connector per plate
HYPERchannel pair	Two plates
HIPPI channel (input or output)	One plate
HIPPI channel (input and output)	Two plates
SCSI	One connector per plate
Pertec	One connector per plate

Step 9—Software

The following Cray Research binary system software and features are included with the CRAY Y-MP EL system. Customers are required to purchase a USL System V, Version 4 license prior to taking delivery of the system.

- USL UNIX System V with Berkeley 4.3 extensions
- Multiprocessing
- Parallel processing
- Enhanced performance file systems
- Enhanced tape support
- Production batch capabilities
- Cray CF77 FORTRAN compiling system
- Cray Standard C compiler
- Cray Pascal compiler (not included but available at no charge)
- Full C and FORTRAN compiler optimization enabled as default
- Binary compatibility with all Cray Y-MP series systems
- Cray assembly language (CAL)
- Utilities
- Cray Research libraries
- Advanced accounting and resource control
- Multilevel security
- Data migration facility
- Advanced system administration
- Standards-based implementation

Cray Software

The following describes briefly the software packages and licenses that are available for the CRAY Y-MP EL system. Note that this is Cray Research software and not Digital software. It is designed for Cray Research platforms such as the CRAY Y-MP EL only. Since the software is licensed by Cray Research directly to the end user, customers must sign Cray Terms and Conditions prior to ordering and receiving software.

- **CRAY UNICOS Environment**—License, software, media and documentation kit included with the system.
- **CRAY USL System V.4 license**—must be purchased for each system.
- **CRAY TCP/IP**—software based on the Fourth Berkeley Distribution implementation of TCP/IP and is appropriate for CRAY Y-MP EL systems connected to other computer systems that are running an implementation of the DoD standard TCP/IP specifications.
- **CRAY Mainframe RQS/VMS**—software used for remote job submission and control to Cray systems running UNICOS from a VMS-based system. RQS/VMS will support all VAX systems except for VAXstation 3100. Supports a maximum of 32 simultaneous connections.
- **CRAY RQS/VMS 1.0 for WSS**—software used for remote job submission and control to Cray systems running UNICOS from a VMS-based system. RQS/VMS will support the VAXstation 3100. Supports a maximum of 32 simultaneous connections.
- **CRAY RQS/VM 1.0**—software used for remote job submission and control to Cray systems running UNICOS from a VM-based system. RQS/VM will support the following IBM mainframes: IBM 370, IBM 390, IBM 9370.
- **CRAY Mainframe RQS/UNIX 2.1**—software used for remote job submission and control to Cray systems running UNICOS from a UNIX-based mainframe. RQS/UNIX supports IBM 3090 systems running AIX/370.
- **CRAY RQS/UNIX 2.1 for WSS**—software used for remote job submission and control to Cray systems running UNICOS from a UNIX-based system. RQS/UNIX supports the following UNIX-based systems: SUN-4 systems (SunOS 4.0.3), Sun SPARCstation (SunOS 4.0.3 and 4.1), IBM RISC System/6000 (AIX Version 3, Release 1.0 and 2.0), DECstation 3100 (ULTRIX 4.2), DECstation 5100 (ULTRIX 4.2), Silicon Graphics 4D (IRIX 3.3 and 4.0), HP 9000/400 and /700 (HP-UX 7.0 and 8.0 respectively), CDC 4000 (EP/IX 3.1)

Step 9—Software *(Continued)*

- **CRAY ADA 2.0 for 1–4 CPUs**—software required for Ada compilation on the CRAY Y-MP EL system. Requires 8 MW (64 Mbytes), but performance is improved with 16 MW (128 Mbytes). Licensed only in binary form.
- **CRAY CVT 1.0**—software is a collection of tools which allow users to create visual interfaces from Cray-based applications. Most of the tools are the result of porting other vendor products to the Cray platform. Licensed only in binary form.
- **CRAY MPGS 4.0**—multipurpose graphics system visualization tool for understanding the results of engineering analysis software running on the CRAY Y-MP EL system. Available in binary code only and resides on an IBM RS/6000 3xx, 5xx or 7xx, or SGI IRIS-4D workstation attached to the EL.
- **CRAY EXPLORER 1.0**—very high level object oriented programming system with visual interfaces at almost every level; used in the building of applications programs. New functional modules may be added to the system using existing code or by writing new code. Visually based tools for the integration into the system and similar tools for integration of new data types and formats are provided. Available in binary code only.
- **CRAY UniChem 1**—applications software environment for computational chemistry. Consists of two major components: "UniChem User Interface," the interactive graphics (workstation-based) modeling system; and "ChemSuite" a third-party and Cray-developed computational chemistry codes (MND090, CADPAC, DGAUSS) integrated through the UniChem User Interface. Available in binary code only and requires a Silicon Graphics IRIS workstation.
- **CRAY CVT 1.0 (University)**—lower-cost license for university use
- **CRAY MPGS 4.0 (University)**—lower-cost license for university use
- **CRAY UniChem 1 (University)**—lower-cost license for university use

Step 10—Installation

The CRAY Y-MP EL has minimal installation and operational requirements and may be installed in most office environments or computer rooms.

CRAY Y-MP EL System Specifications

Physical Characteristics

	Mainframe Cabinet	Expansion Cabinets
Height	144 cm (56.75 in.)	144 cm (56.75 in.)
Width	127 cm (50.00 in.)	127 cm (50.00 in.)
Depth	83 cm (32.75 in.)	57 cm (22.56 in.)
Weight	635 kg (1400 lb) maximum 411 kg (906 lb) minimum	635 kg (1400 lb) maximum 411 kg (906 lb) minimum
Access requirements	30 cm (12 in.)—rear 76 cm (30 in.)—each side 91 cm (36 in.)—front*	**—rear 76 cm (30 in.)—each side 91 cm (36 in.)—front*

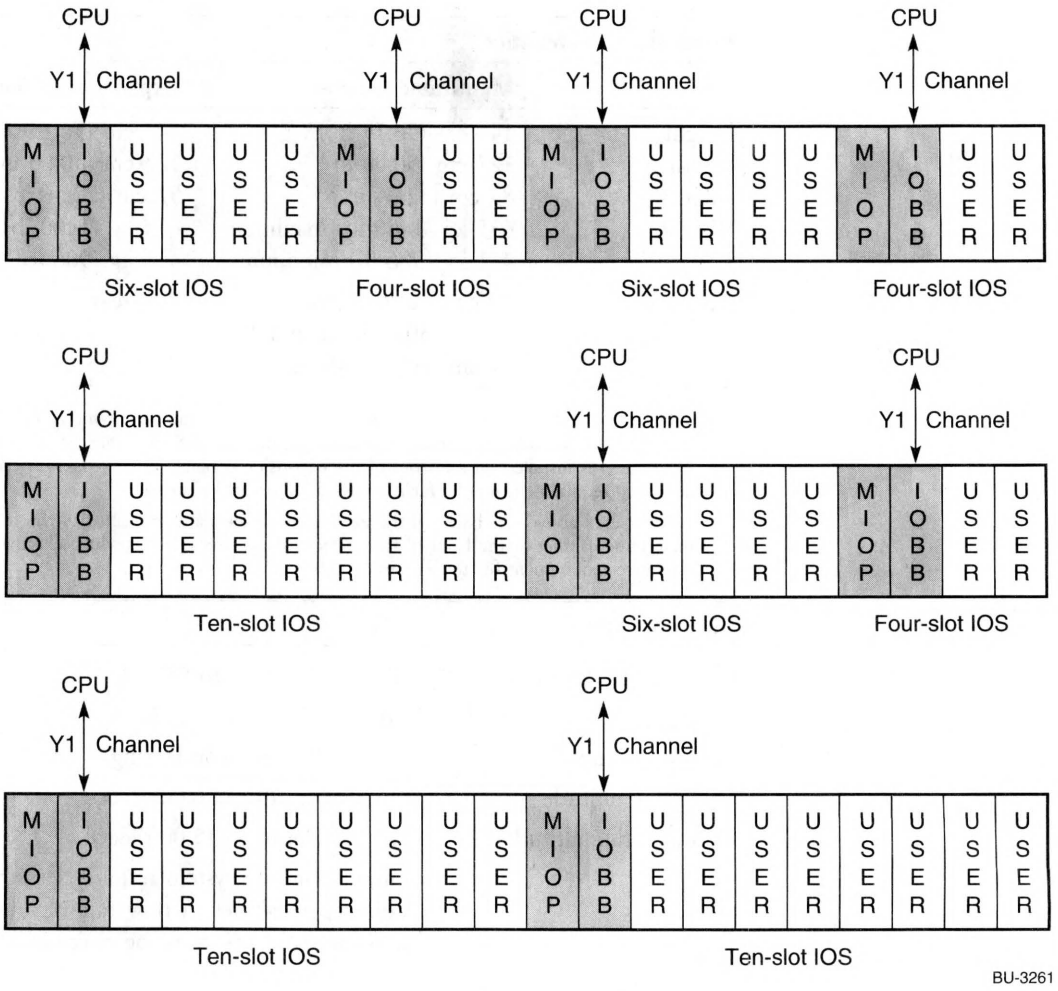
* When expansion cabinets are installed, the front panel of the mainframe cabinet is removed and the expansion cabinets are attached to the front of the mainframe cabinet. Then the radiused front panel is installed on the front of the expansion cabinet. With expansion cabinets, the front clearance requirement for the mainframe cabinet is no longer valid.

** As described above, the backs of the expansion cabinets are connected to the front of the mainframe cabinet or the front of the previous expansion cabinets which eliminate the rear clearance requirement for the expansion cabinets.

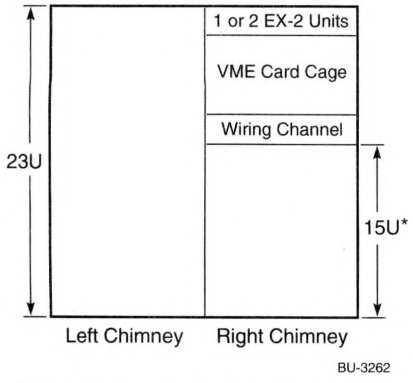
Environmental

Operating temperature	10° to 35° C (50° to 95° F)
Non-operating temperature	–10° to 50° C (14° to 122° F)
Relative humidity	20% to 80% noncondensing
Operating altitude	0 to 3000 m (0 to 10,000 feet)
Nonoperating altitude ***	0 to 4500 m (0 to 15,000 feet)
Cooling	Fully configured system requires less than 2 tons of cooling per cabinet. A flow rate of not less than 1274 lpm (45 cfm) must be maintained through the area.

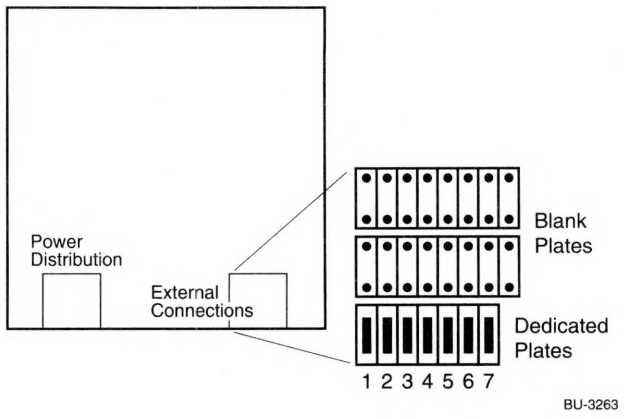
*** The system must be shipped in a pressurized cargo bay for altitudes greater than 4500 m (15,000 feet).



Three VME Card-cage Configurations

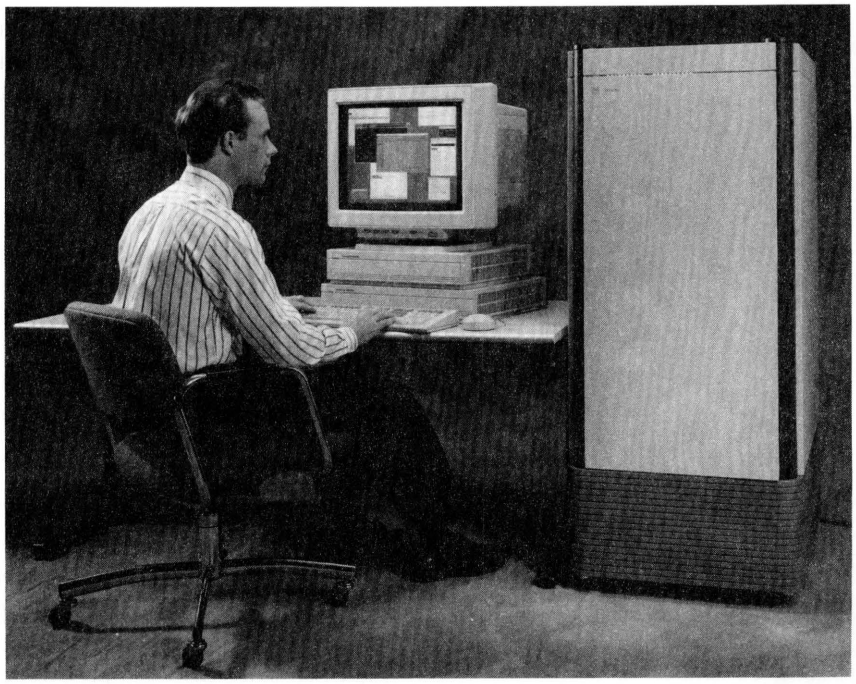


Cabinet Configuration



External Connections

DECmpp 12000/12000-LC Massively Parallel Processing Systems



Product Description

DECmpp 12000 and 12000-LC system series introduces a family of computers based on massively parallel processing (MPP), a high-performance technology targeted to meet the needs of scientific and commercial users. DECmpp 12000 and 12000-LC differ only in cabinet size, capacity, and choice of console. The low-end 12000-LC series starts at 1K and expands to 4K processor elements, delivering a maximum of 6,400 MIPS (150 Mflops) of processing power. The high-end DECmpp 12000 series starts at 1K and expands to 16K processor elements and delivers a maximum of 26,000 MIPS (773 Mflops) of processing power. Both series may be upgraded simply by adding PE boards.

Massively parallel processing is an outgrowth of the quest to speed computer processing. The faster CPU requires more memory and larger input/output bandwidth to maintain balanced, high-speed operations. Multiple-processor implementations, with four, six, or even a hundred or more processors can bring significant increases in speed, coordinated by additional logic to maintain synchronization. Operating in a Single Instruction Multiple Data (SIMD) fashion, thousands of processor elements can work on a single problem simultaneously.

DECmpp's integrated software provides access to hundred of utilities. The DECmpp Parallel Programming Environment (symbolic debugger, machine animator, data visualizer, etc.), DECmpp system software, and DECmpp FORTRAN compiler work identically on high- and low-end offerings. Parallel disk arrays provide 5.8 to 23 Gbytes of magnetic storage for all configurations, and are fully supported by DECmpp parallel disk systems that can store up to 23 Gbytes of data.

The DECmpp 12000 systems are available with either a DECsystem 5900 server or a DECstation 5000 Model 240 workstation. The DECsystem 5900 is configured with 32 Mbytes of memory, a VME adapter, one 1.3 Gbyte RZ58 hard drive, one RRD42 CD-ROM drive, and an ULTRIX 4-user server license. The DECstation 5000 Model 240 is configured with 32 Mbytes of memory, a VME adapter, an SZ12 expansion box with one 1.3 Gbyte RZ58 hard drive, and one RRD42 CD-ROM drive, and an ULTRIX 2-user workstation license. The DECstation or

DECmpp 12000/12000-LC Massively Parallel Processing Systems

Product Description *(Continued)*

DECsystem functions as a general-purpose console to control and execute sequential code, and to provide an interface for system administration and diagnostics. VAX 9000 users can access the data parallel unit through the DECstation/DECsystem console.

The DECmpp 12000 series systems consist of massively parallel processing systems and parallel disk array systems.

Although the DECmpp 12000 series uses many interconnected processing elements to achieve high performance, it features a single, integrated software environment based on the ULTRIX operating system, for developing complex scientific and commercial applications. The user interface to the software environment is based on the DECwindows system and supports access from DECwindow terminals and DECstation workstations.

DECmpp 12000 and 12000-LC System Software:

- DECmpp System Software includes a C-like, high-level language compiler as the primary programming language for the DECmpp system's data parallel unit.
- DECmpp Parallel Programming Environment consists of a comprehensive set of development tools for data parallel programming. Features include an easy-to-use interactive Motif-like point-and-select interface for users to visualize and analyze the behavior of DECmpp processor elements, algorithms, and data. The DECmpp tool set includes a symbolic debugger, a machine animator, and data visualizer.
- DECmpp Image Processing Library is a highly optimized set of image processing routines supporting the development of high-performance image processing solutions in a fully programmable platform. Library routines are callable from standard languages such as C, FORTRAN, and DECmpp programming language. The library includes routines for image arithmetic, low-level image processing operations, and image analysis, as well as utilities for image display, I/O, test image generation, and format conversion.
- DECmpp FORTRAN: DECmpp FORTRAN, a FORTRAN 77 based compiler with FORTRAN 90 features, greatly simplifies the process of porting and adapting existing FORTRAN programs for execution on DECmpp 12000 systems. Modifications to the code and new data structures can be developed quickly. Scalar sections of most FORTRAN 77 programs need no change.

  DECmpp FORTRAN makes DECmpp 12000 systems truly transparent to the application developer. The optimizing compiler automatically separates scalar and parallel code, distributes data across the processing elements, accesses different functional units as needed, and integrates all communications and I/O Programming Environment for application development and debugging.

  DECmpp FORTRAN also allows users to develop parallel code without a DPU. Using the *-scalar* option, code is generated for execution on the workstation using *runnodpu* included in the package. Here, all constructs are linearized, and intrinsic calls for parallel execution are converted to sequential in-line algorithms. Source code can be re-compiled without modification at any time for parallel execution with the DPU. Programs compiled in scalar mode are fully debuggable under the DECmpp Programming Environment.

The disk array provides systems with up to 23 Gbytes of formatted capacity and can be upgraded from four disks operating at 3 Mbytes/second to 24 disks operating at 9 Mbytes/second sustained disk I/O. Digital's TKZ08 tape drive may be used to back up the parallel disk array.

Product Description *(Continued)*

Markets for DECmpp systems include industries such as oil/gas, chemical, pharmaceutical, automotive/aerospace, financial, education, Government, and defense. Typical applications include geophysical data processing, ocean and atmospheric modeling, seismic processing and reservoir analysis, structural dynamics and acoustics, computational chemistry and physics, simulation of neural nets, molecular modeling, image processing and recognition, computational fluid dynamics, signal processing (1D, 2D, 3D), and database and text retrieval.

- DECmpp Math Library: The DECmpp Math Library ("DPML") is a set of mathematical routines optimized for DECmpp 12000 systems. The library supports the three primary groups of routines, which may be called from either DPL or FORTRAN: linear algebra solvers, linear algebra building blocks, Fourier transforms for one- and two-dimensional data.

  Like the Image Processing Library, DPML uses an internal virtualization strategy for optimal performance across all configurations of DECmpp. Similarly, all routines operate on the DECmpp 12000 massively parallel unit, not on its DECstation front end.

- DECmpp VAST-2: DECmpp VAST-2—a new development tool—translates FORTRAN 77 source code to DECmpp's FORTRAN. It's primary use is to translate FORTRAN 77 DO loops to FORTRAN 90 array syntax for efficient execution on DECmpp systems. VAST-2 also supports a scalarization option, which enables the translation of FORTRAN 90 array syntax back to FORTRAN 77. VAST-2 has:

  - Sophisticated data dependency analysis to ensure safe translation of loops
  - User directives and switches to control all aspects of the translation process
  - Reordering of array references to avoid dependencies
  - In-line expansion of subroutines and functions

  DECmpp VAST-2 optimizes programs by exposing implicit parallelism. Performance of VAST-generated code is highly dependent on the nature of the algorithm, structure of the data, and programming style. Best results are almost always obtained for programs that have been restructured to take advantage of VAST's abilities and for code that has been mapped to DECmpp's architecture efficiently.

DECmpp 12000/12000-LC Massively Parallel Processing Systems

Step 1—Systems

Select system. 120-V systems include a U.S. keyboard an all required power cords. For 240-V systems select country-specific power cord and keyboard from Step 2. Order DECmpp system license and software media and documentation from Step 10.

DECmpp systems with DECstation 5000 Model 240 include:

- Base module with 40-MHz CPU daughter card
- TURBOchannel I/O interconnect—three slots total
- Memory, 32 Mbytes
- Thick wire Ethernet controller on base system module
- Synchronous SCSI controller on base system module
- SZ12 expansion box with 1.3-Gbyte (RZ58) disk and 600-Mbyte (RRD42) compact disk drive
- 8-plane HX graphics board
- Monitor, 19-inch color (VR299)
- U.S. keyboard, 120 V
- Three-button mouse
- Two EIA-232 serial communication (synchronous/asynchronous) ports
- 3-meter (10-foot) video cable
- 3-meter (10-foot) keyboard/mouse cable
- 1.8-meter (6-foot) SCSI cable (50-pin small connector to 50-pin large connector)
- 1.8-meter (6-foot) power cord, 120-V systems only
- 0.9-meter 3-foot convenience power cord (monitor to system box)
- Universal power supply that automatically adjusts to 88–132 Vac or 176–264 Vac
- ULTRIX workstation two-user base license, DEC C and OSF/Motif
- English-language user documentation

DECmpp systems with DECsystem 5900 include:

- Base module with 40-MHz CPU
- TURBOchannel I/O interconnect—three slots total
- TURBOchannel extender
- Memory, 32 Mbytes
- Embedded Thick wire 802.3/Ethernet controller
- Synchronous SCSI controller on base system module
- 67-inch cabinet with 19-inch rack-mountable drawers
- RZ58 1.38-Gbyte SCSI drive
- RRD42 600-Mbyte CD-ROM drive
- VME adapter
- VT420 terminal
- U.S. keyboard
- 120-V power cord
- Prestoserve license (QL-YV5AS-AA) and functionality
- ULTRIX base license
- ULTRIX four-user server license

Model Number 120 V/240 V/S.H.*	Model	Console	Processor Elements
MP001-BA/BB/BC	DECmpp 12000-LC	DECstation 5000/240	1K 16-Mbyte RAM
MP002-BA/BB/BC	DECmpp 12000-LC	DECstation 5000/240	1K 64-Mbyte RAM
MP101-BA/BB/BC	DECmpp 12000	DECstation 5000/240	1K 16-Mbyte RAM
MP102-BA/BB/BC	DECmpp 12000	DECstation 5000/240	1K 64-Mbyte RAM
MP101-CA/CB/CC	DECmpp 12000	DECsystem 5900	1K 16-Mbyte RAM
MP102-CA/CB/CC	DECmpp 12000	DECsystem 5900	1K 64-Mbyte RAM
MP103-CA/CB/CC	DECmpp 12000	DECsystem 5900	4K 16-Mbyte RAM
MP104-CA/CB/CC	DECmpp 12000	DECsystem 5900	4K 64-Mbyte RAM
MP105-CA/CB/CC	DECmpp 12000	DECsystem 5900	8K 16-Mbyte RAM
MP106-CA/CB/CC	DECmpp 12000	DECsystem 5900	8K 64-Mbyte RAM
MP107-CA/CB/CC	DECmpp 12000	DECsystem 5900	16K 16-Mbyte RAM
MP108-CA/CB/CC	DECmpp 12000	DECsystem 5900	16K 64-Mbyte RAM

* 120V/240V/S.H indicates voltage of workstation and monitors only, e.g., -AC includes monitor for operation in Southern Hemisphere.

Note: Data parallel unit in all models requires a power source of 240 V, 50/60 Hz.

Step 2—Power Cords and Keyboards (not required for 120-V systems)

Power Cord and	Keyboard	Country	Language
BN19W-2E	LK401-AG	Austria	German/Austrian
BN19K-2E	LK401-AB	Belgium	Flemish
BN19K-2E	LK401-AD	Denmark	Danish
BN19W-2E	LK401-AF	Finland	Suomi
BN19W-2E	LK401-AP	France	French
BN19W-2E	LK401-AG	German	German
BN19W-2E	LK401-AH	Holland	Dutch
BN19U-2E	LK401-AT	Israel	Hebrew
BN19Z-2E	LK401-AI	Italy	Italian
BN19W-2E	LK401-AN	Norway	Norwegian
BN19W-2E	LK401-AV	Portugal	Portuguese
BN19W-2E	LK401-AS	Spain	Spanish
BN19W-2E	LK401-AM	Sweden	Swedish
BN19E-2E	LK401-AK	Switzerland	French
BN19E-2E	LK401-AL	Switzerland	German
BN19A-2E	LK401-AA	U.K./Ireland	English
BN19H-2E	LK401-AA	Australia/N.Z.	English
BN19P-1K	LK401-AA	Canada	English
BN19P-1K	LK401-AC	Canada	French

Step 3—Processor Element Array Options

- DECmpp 12000 systems support a maximum of 16 processor element (PE) boards.
- DECmpp 12000-LC systems support a maximum of four processor element (PE) boards.
- PE boards must be same type; -AA boards cannot be mixed with AB boards.

KP100-AA	1K PE board with 16 Mbytes of RAM
KP100-AB	1K PE board with 64 Mbytes of RAM
KP100-AC	1K PE board upgrade from 16 Mbytes to 64 Mbytes of RAM

Step 4—Memory

- Systems with DECsystem 5900 include 32 Mbytes and are expandable to 448 Mbytes
- Systems with DECstation 5000 Model 240 include 32 Mbytes are expandable to 120 Mbytes

MSO2-CA	32-Mbyte ECC memory for DECsystem 5900
MSO2-AA	8-Mbyte ECC memory for DECstation 5000

Note: MS02-AA memory modules cannot be mixed with MS02-CA modules.

Step 5—Parallel Disk Arrays

- Parallel disk arrays and upgrades require an I/O controller.
- I/O controller supports 16 data disks.

KF100-AA DECmpp I/O controller with 8 Mbytes

- Select parallel disk array.
- System supports a maximum of 16 data disks.

SMP11-AA	Parallel disk array system, four data disks, 5.8 Gbytes
SMP11-AB	Parallel disk array system, eight data disks, 11.5 Gbytes
SMP11-AC	Parallel disk array system, 16 data disks, 23 Gbytes

Step 5a—Parallel Disk Array Upgrades

- Select additional disk array upgrades; system maximum is 16 disks.

SMP12-AA	Upgrades SMP01-AA to SMP01-AB (four additional disks)
SMP12-AB	Upgrades SMP01-AA to SMP01-AC (12 additional disks)
SMP12-AD	Upgrades SMP01-AB to SMP01-AC (eight additional disks)

Step 5b—Hard Disk

RMP11-AA 1.5-Gbyte hard disk and controller for use as a hot standby disk for critical applications

Step 6—TURBOchannel Options

PMAZ-AA	SCSI TURBOchannel option card, supports an additional six external devices

Step 7—Networking Cables

BC16M-xx	ThinWire Ethernet cable (xx = 06/15/30; refers to length in feet)
BNE3H-xx	Thick wire transceiver cable with straight connector (PVC) (xx = 05/10/20/40, refers to length in meters)
BNE3L-xx	Thick wire transceiver cable with straight connector (Teflon) (xx = 05/10/20/40, refers to length in meters)

Step 8—Software

- Systems with DECstation 5000 Model 240 include: ULTRIX Workstation two-user base license, DEC C and OSF/Motif
- Systems with DECsystem 5900 include: ULTRIX four-user server license

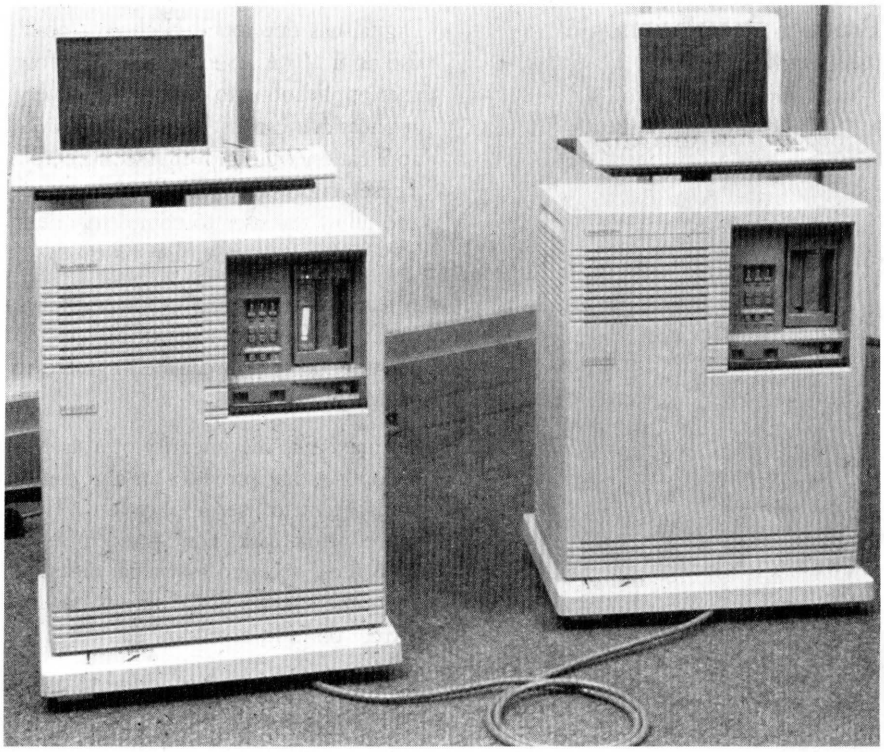
Part Numbers for DECmpp Software Version 1.1

An ULTRIX media and documentation kit is recommended for the first system on site.

QA-VV1AA-H8	ULTRIX workstation media (CD-ROM) and documentation kit (include DECnet-ULTRIX media)
QA-VYVAA-H8	ULTRIX server media (CD-ROM) and documentation kit
DECmpp System Executibles	
QA-XT4AA-H8	ULTRIX/RISC executibles (CD-ROM)*
DECmpp System Software	
QL-XT4A8-AA	DECmpp system-wide license
QA-XT4AA-WZ	Update from V1.0
QA-XT4AB-GZ	Documentation
DECmpp Fortran	
QL-XT6A8-AA	System-wide license
QL-XT6A8-3B	Concurrent-use license
QA-XT6AA-WZ	Update from V1.0
QA-XT6AB-GZ	Fortran documentation
DECmpp Programming Environment	
QL-XT7A8-AA	System-wide license
QL-XT7A8-3B	Concurrent-use license
QA-XT7AA-WZ	Update from V1.0
QA-XT7AB-GZ	Documentation
DECmpp Image Processing Library	
QL-XT5A8-AA	System-wide license
QA-XT5AA-WZ	Update from V1.0
QA-XT5AB-GZ	Documentation
DECmpp Math Library	
QL-MTCA8-AA	System-wide license
QA-MTCAA-GZ	Documentation
DECmpp VAST-2	
QL-MTBA8-AA	System-wide license
QL-MTBA8-3B	Concurrent-use license
QA-MTBAA-GZ	Documentation

* All DECmpp software products are distributed together on the same media.

MIRA Application Switch 3400/3800



Product Description

The MIRA Application Switch (MIRA AS) 3400/3800 is the second generation in Digital's family of MIRA high-availability systems. A MIRA AS configuration is a fully redundant master standby system based on dual MicroVAX 3400 or 3800 configurations. The applications for MIRA AS are similar to MIRA 3200 systems except that auto failover of Q-bus options is not supported.

Each MicroVAX is housed in a BA2xx-style cabinet and includes a hardware watchdog (KWV32) linked via a dedicated interprocessor communications cable. The dedicated link and its synchronous protocol guarantee a deterministic failover time of less than one second.

In addition, MIRA Disk Shadowing is available as an option on MIRA AS systems. This product provides an automatic backup of data, and is fully transparent to the user applications.

The type of disk used for data storage determines the degree of availability achievable with MIRA AS systems. A 400-Mbyte RF71 ISE is used for the system disk on all MIRA AS systems. A DSR70 dual-ported storage system is recommended for additional data storage due to its redundant architecture and maximum storage capability.

MIRA AS extends the range of detected errors to the device level. In this manner, faulty devices are functionally isolated, while the processor itself continues to operate (as long as the device fault does not impact the Q-bus).

MIRA AS performs the same type of total failover as MIRA 3200. However, with its enhanced error detection, MIRA AS provides automatic failover at the applications level. The selectivity afforded by MIRA AS allows a single application to failover to the standby processor without affecting the status of the other critical applications.

Product Description
(Continued)

Digital has developed High Availability Management Software (MIRA HAMS) for use on a MIRA AS system. This software provides the functionality that allows user applications to initiate a recovery procedure as fast as one second. Up to 16 applications can use the MIRA HAMS failure management environment. Each application will failover selectively, based on individually defined "action tables." These action tables are filled in by the user at the time of system configuration, and allow the user to completely define and control error recovery strategy on a application-by-application basis.

A standard VMS application must be adapted to a MIRA AS environment in order to take advantage of MIRA HAMS. Applications already running on a MIRA 3200 system can be migrated to MIRA AS by relinking with the MIRA HAMS library.

To maximize the integrity of a user database, MIRA Disk Shadowing software is an option that provides an automatic backup of valuable data, and is fully transparent to user applications. The shadowing software writes data on two or more virtual disks configured in a shadow set. Shadowed disks are contiguous RMS files, declared as virtual disks. Disks of mixed types and sizes can coexist in the same shadow set. There is no limit imposed on the maximum number of virtual disks in a shadow set.

When a virtual disk is added to a shadow set, the MIRA Disk Shadowing software starts an automatic catch-up procedure to update its contents. During the catch-up procedure, the shadow set continues to be available for the user. This catch-up feature allows routine backup of virtual disks—with no interruption of normal operations. MIRA AS system can also run VMS/Host Volume Shadowing.

The MIRA Application Switch 3400/3800 rules of configuration are exactly the same as those used for dual-host systems, without any exception. Each processor of the MIRA AS system requires its own operator console (recommended are one VT420 terminal plus one LA75 printer on each). Options are factory integrated into the MIRA AS systems prior to customer shipment.

Each processor in a MIRA AS system has its own RF71 system disk and a TK70 tape system integrated within a BA2xx processor enclosure. Data disks are ordered separately.

MIRA AS Model Matrix

The following table presents the system models offered in MIRA AS configurations. Each system contains two computers; and the table indicates the features offered with each computer.

System Models[4]	MicroVAX CPU	Mbytes of Memory	Disk	Tape	Ethernet	Watchdog	VMS Licenses	DECnet Licenses	MIRA HAMS License
DV-34MS3-B2/B3	3400	4	RF71	TK70	Yes	Yes	Yes[1]	Yes[2]	Yes
DV-34MT3-B2/B3	3400	12	RF71	TK70	Yes	Yes	Yes[3]	Yes[2]	Yes
DV-38MS3-A2/A3	3800	16	RF71	TK70	Yes	Yes	Yes[1]	Yes[2]	Yes
DV-38MT3-A2/A3	3800	16	RF71	TK70	Yes	Yes	Yes[3]	Yes[2]	Yes

Note: A2 and B2=120 V; A3 and B3=240 V. 120-V systems include U.S. power cords.

[1] VMS file and application server license. VMS VAXcluster Software license.
[2] DECnet full-function and end-node licenses (one each).
[3] VMS 1- to 10-user license (with Rdb/VMS Runtime).
[4] MIRA AS system packages utilizing VAX 4000 or VAX 6000 CPUs are available on a custom quotation basis. Contact the EIC Sales Support Center at 800-632-6277 or 603-884-8990 for more information.

MIRA AS 3400 VMS Server Dual-Host System

DV-34MS3-B2

Each half of the system includes:

- KA640 CPU board with embedded 802.3/Ethernet (ThinWire/thick wire) controller, DSSI adapter, and 4-Mbyte ECC memory
- BC16E-10 console terminal cable
- RF71 400-Mbyte ISE disk
- BA213 system enclosure
- TK70 296-Mbyte cartridge tape drive and controller
- KWV32 watchdog module, adapters, 7.6-meter (25-foot) cable, and loopback connectors
- BC21M-09 DSSI cable (quantity one only)
- VMS File Application Server license
- DECnet full-function and end-node licenses (one each)
- VMS VAXcluster Software license
- MIRA HAMS license
- Power cord, documentation, and diagnostic kit
- One full-year product warranty

MIRA AS 3400 VMS Multiuser Dual-Host System

DV-34MT3-B2

Each half of the system includes:

- KA620 CPU board with embedded 802.3/Ethernet (ThinWire/thick wire) controller, DSSI adapter, and 4-Mbyte ECC memory
- BC16E-10 console terminal cable
- MS650-AA 8-Mbyte memory (system total 12 Mbytes)
- RF71 400-Mbyte ISE disk
- BA213 system enclosure
- TK70 296-Mbyte cartridge tape drive and controller
- KWV32 watchdog module, adapters, 7.6-meter (25-foot) cable, and loopback connectors
- BC21M-09 DSSI cable (quantity one only)
- VMS 1- to 10-user license (with Rdb/VMS Runtime)
- DECnet full-function and end-node licenses (one each)
- VMS VAXcluster Software license
- MIRA HAMS license
- Power cord, documentation, and diagnostic kit
- One full-year product warranty

Note: For configuration assistance, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

MIRA AS 3800 VMS Server Dual-Host System

DV-38MS3-A2

Each half of the system includes:

- KA655 CPU board (note *Multiuser* systems use -AA variant and *Server* systems use -BA variant)
- BC16E-10 console terminal cable
- MS650-BA 16-Mbyte memory (system total 16 Mbytes)
- RF71 400-Mbyte ISE disk
- BA213 system enclosure
- TK70 296-Mbyte cartridge tape drive and controller
- KWV32 watchdog module, adapters, 7.6-meter (25-foot) cable, and loopback connectors
- KFQSA DSSI adapter
- DESQA 802.3/Ethernet interface (ThinWire/thick wire)
- BC21M-09 DSSI cable (quantity one only)
- VMS File and Application Server license
- DECnet full-function and end-node licenses (one each)
- VMS VAXcluster Software license
- MIRA HAMS license
- Power cord, documentation, and diagnostic kit
- One full-year product warranty

MIRA AS 3800 VMS Multiuser Dual-Host System

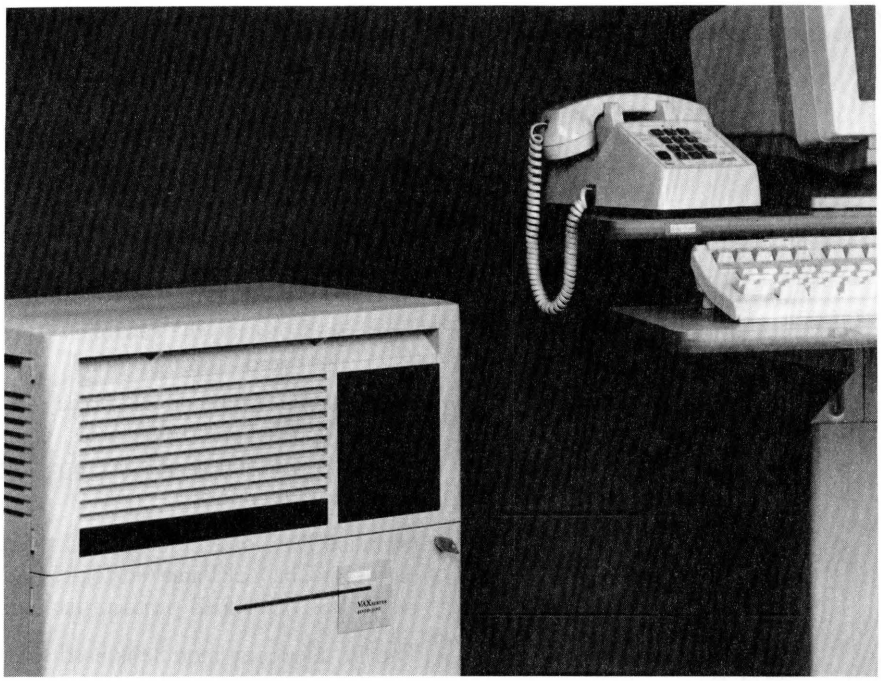
DV-38MT3-A2

Each half of the system includes:

- KA655 CPU board (note *Multiuser* systems use -AA variant and *Server* systems use -BA variant)
- BC16E-10 console terminal cable
- MS650-BA 16-Mbyte memory (system total 16 Mbytes)
- RF71 400-Mbyte ISE disk
- BA213 system enclosure
- TK70 296-Mbyte cartridge tape drive and controller
- KWV32 watchdog module, adapters, 7.6-meter (25-foot) cable, and loopback connectors
- KFQSA DSSI adapter
- DESQA 802.3/Ethernet interface (ThinWire/thick wire)
- BC21M-09 DSSI cable (quantity one only)
- VMS 1- to 10-user license (with Rdb/VMS Runtime)
- DECnet full-function and end-node licenses (one each)
- VMS VAXcluster Software license
- MIRA HAMS license
- Power cord, documentation, and diagnostic kit
- One full-year product warranty

Note: For configuration assistance, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

Multiline DECvoice



Product Description

Multiline DECvoice, Digital's voice-processing platform for VOICEmail, provides flexible configurations for three voice technologies all optimized for use over a standard telephone—digitized (stored) voice, speech synthesis, and voice recognition—all on one platform. The product is software configurable and operates in both multiline (8-line) and full-function (single-line) modes.

Multiline DECvoice is a VAX 4000-based voice-processing platform that supports one to 72 simultaneous telephone calls via the T1 telephony interface. The basic product is a Q-bus peripheral available for installation in the S-box series of MicroVAX 3300/3400/3500/3600/3800/3900 systems or VAX 4000 Model 200/300/500/600 systems. Packaged systems are based on the VAX 4000 Model 200/300/500/600 platforms and provide server, timeshare, and, for mission-critical applications, dual-host system variants.

Multiline DECvoice consists of a voice-processing option, a T1 telephony option, cables, and DECvoice software integrated into a VAX 4000 system. The systems are configurable from one to 72 channels of voice (phone lines). Three T1 spans can be connected directly to the system via the T1 telephony module. Analog phone lines can be connected via channel banks into the T1 module. Multiline DECvoice can be configured with multiple combinations of digitized, synthesized, and voice recognition support depending on the requirements of the application.

Based on the VAX VMS architecture, Multiline DECvoice VAX 4000 packaged systems are compatible with the entire line of VAX systems. Packaged systems are available in 8, 16, 24, 48, and 72 ports (phone lines). Hardware component options are available in 8-line increments (one module) up to a maximum of 72 lines depending on processor type.

Multiline DECvoice includes the following telephony and voice technologies:

- **Digitized Voice**—Multiline DECvoice can digitally record speech that can later be retrieved and played back over the telephone, using the same principles as a high-quality compact disc recording. Multiline DECvoice also supports the conversion of certain ASCII strings into concatenated digitized voice output.

Product Description *(Continued)*

- **Speech Synthesis**—Multiline DECvoice contains an improved version of the DECtalk speech synthesizer. Both Multiline DECvoice and DECtalk can convert ordinary ASCII text into high-quality, human-sounding speech. Special name pronunciation software is provided to allow speech synthesis of foreign surnames and geographical names; the resulting output can be used by both Multiline DECvoice and DECtalk synthesizers.
- **Voice Recognition**—Multiline DECvoice has the ability to recognize and respond to human speech. Two voice recognizers are supported by Multiline DECvoice: an isolated word recognizer and a separately licensed continuous word recognizer. Both provide the capability to recognize the words "yes," "no," "oh" (for zero), and "zero" through "nine."
- **Touch-Tone**—Multiline DECvoice can accept, generate, and detect the full set of DTMF (Touch-Tone) frequencies, including the military extensions. Touch-Tones can be used to interrupt voice operations, which can later be resumed under user program control.

Multiline DECvoice requires a T1 telephone interface, PBX integration, and may require a Channel Bank (analog-to-digital converter) and a Software Integration Device (SID) for PBX protocol handling if Voicemail applications are used.

The T1 telephony module is used to connect the DECvoice system to a maximum of three digital DS1 telephone circuits (72 lines). The option consists of a quad-width Q-bus module and a bulkhead adapter assembly used for telephone network connection and a voice interconnect bus connection. Each DS1 circuit can be up to 200 meters (655 feet) in length. **Note:** Many PBXs have distance limitations of approximately 30.5 meters (100 feet.) Signal framing can be either D3/D4 or ESF compliant selectable under software control.

A variety of signaling techniques are available on a per-channel basis under software control including E&M, FXO/FXS, and DPO/DPT. Flash-hook signaling can be detected and generated. DTMF or pulse dialing can be selected on a per-channel basis for outdialing applications.

The DTC05 option is a quad-width Q-bus module that provides voice generation and recognition capability. DECvoice software allows the DTC05 option to operate in either multiline mode (8 lines) to support digitized speech OR in the full-function mode (single line) to support digitized speech and enhanced functionality such as recognition and synthesis. The modules can be configured under software control to provide a combination of "standard" mode digitized voice, or enhanced functionality within the system. Recognition and synthesis are not currently supported in the multiline mode.

Refer to the Multiline DECvoice Software Product Description (SPD 29.97.xx) and Software Support Addendum (SPD/SSA 29.97.xx-x) and the current VMS Software Product Description and Software Support Addendum for the most complete list of supported systems and hardware configurations.

Multiline DECvoice provides users with the tools necessary to customize the isolated word recognition capabilities for application specific vocabularies.

To hear a demonstration of DECvoice and the Continuous Word Recognizer, call 508-493-1923.

Multiline DECvoice

Features

Multiline DECvoice hardware and software have been designed to allow access to the North American telephone network by voice applications on a VAX platform.

Multiline DECvoice software supports the following functionality:

- Answers telephone calls.
- Originates telephone calls.
- Generates hook-flash signaling that can be used to control certain PBX features such as call-transfer capability.
- Detects and generates DTMF tones (Touch-Tone).
- Records and plays digitized messages in a variety of standardized formats.
- Synthesizes messages from ASCII text (single-line-mode).
- Call progress analysis (multi-line-mode).
- Automatic volume leveling of messages.
- Performs speaker-independent voice recognition of a predefined vocabulary (single-line mode).
- Performs speaker-dependent voice recognition of a user-defined vocabulary (single-line mode).
- Integrates advanced voice technologies into the VAX platform.
- Supports up to 72 lines (telephone calls) on a single system.
- High-level application programming interface and tools based on a VMS V5.3/5.4 Runtime library.
- Recording of voice prompts is performed with an ordinary telephone.
- User-selectable recording formats, including 64-Kbps uLAW, 64-Kbps ALAW, 24- and 32-Kbps ADPCM, and 16-Kbps Subband.
- The isolated and continuous word recognizers support a speaker-independent 13-word vocabulary: the digits zero through nine, "yes," "no," and (often used as substitute for zero) "oh."
- The isolated word recognizer can be user-trained for a speaker-dependent, application-specific, vocabulary.
- The softload design of the DECvoice hardware means that updating to new microcode releases is easily accomplished.
- Can be switched between multiline (8-line digitized voice only mode) and enhanced (1-line digitized voice, synthesis, and recognition mode) under software control.

Multiline DECvoice is available in packaged system configurations of 8-, 16-, 24-, 48-, and 72-line server, timeshare, and dual-hosted variants, or as an option module set for field upgrades of the MicroVAX 3300/3400/3500/3600/3800/3900 systems and any pre-installed VAX 4000 Model 200/300/500/600 systems.

Note: Multiline DECvoice is available in the U.S. and Canada only. For ordering, configuration support, and information on the continuous word recognition license, call the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

Step 1—Multiline DECvoice Systems

Multiline DECvoice systems are available as prepackaged voice solutions and include software, user licenses, media, and documentation. Additional voice modules may be purchased (in 8-line increments) to support specific configurations or enhanced functionality not listed below. Systems available include servers, timeshare, and dual-hosted variants. Load devices and console terminals/monitors are NOT included and must be ordered separately.

DECvoice Packaged VAX 4000 Model 200 Systems

CL-42RS1-VA 8-line VAXserver system, VMS 1- to 2-user license
CL-42RT1-VA 8-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 200
- BA215 pedestal enclosure
- 120-V 60-Hz power supply
- 8-Mbyte memory module (MS650-BB)
- DSSI adapter and Ethernet adapter on CPU
- DTCN5-UG T1 upgrade kit
- RF31F 200-Mbyte disk drive
- DECvoice on TK50 media
- DECnet-VAX end-node license
- DECvoice software license
- Hardware and software documentation

CL-42HS1-VA 16-line VAXserver system, VMS 1- to 2-user license
CL-42HT1-VA 16-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 200
- BA430 pedestal enclosure
- Universal power supply
- 16-Mbyte memory module (MS650-BA)
- DSSI adapter and Ethernet adapter on CPU
- DTCN5-UG T1 upgrade kit
- DTC05-SA voice processing module
- RF31F 200-Mbyte disk drive
- DECvoice on TK50 media
- DECnet VAX end-node license
- DECvoice software license
- Hardware and software documentation

DECvoice Packaged VAX 4000 Model 300 Systems

CL-43JS1-CA 24-line VAXserver system, VMS 1- to 2-user license
CL-43JT1-CA 24-line VAX timesharing system, VMS 1- to 40-user license

- Multiline DECvoice VAX 4000 Model 300
- BA440 pedestal enclosure
- Universal power supply
- 32-Mbyte memory module (MS670-BA)
- Two DSSI adapters and one Ethernet adapter on CPU
- Two DTC05-SA voice processing modules
- DTCN5-UG T1 upgrade kit
- RF31E-AF 381-Mbyte disk drive
- DECvoice on TK50 media
- DECnet-VAX end-node license
- VAXcluster software license
- DECvoice software license
- Hardware and software documentation

DECvoice Packaged VAX 4000 Model 300 Systems *(Continued)*

CL-43JS2-AA 48-line dual-host VAXserver system, VMS 1- to 2-user license
CL-43JT2-AA 48-line dual-host timesharing system, VMS 1- to 40-user license

- Multiline DECvoice VAX 4000 Model 300 dual-host system
- Two BA440 pedestal enclosures
- Universal power supply
- 32-Mbyte memory module (MS670-BA) per system
- Two DSSI adapters and one Ethernet adapter on each CPU
- Two DTC05-SA voice processing modules
- DTCN5-UG T1 upgrade kit per CPU
- Two RF31E-AF 381-Mbyte disk drives
- DECvoice TK50 media
- DECnet-VAX end-node license
- VAXcluster software license
- DECvoice software license
- Hardware and software documentation

CL-43JS1-DA 72-line VAXserver system, VMS 1- to 2-user license

- Multiline DECvoice VAX 4000 Model 300
- BA440 pedestal enclosure
- Universal power supply
- Two 32-Mbyte memory modules (MS670-BA)
- Two DSSI adapters and one Ethernet adapter on CPU
- Eight DTC05-SA voice processing modules
- DTCN5-UG T1 upgrade kit
- RF31E-AF 381-Mbyte disk drive
- B400X-B9 expansion enclosure
- TDM expansion cable/bulkhead
- DECvoice TK50 media
- VAXcluster software license
- DECnet-VAX end-node license
- DECvoice software license
- Hardware and software documentation

DECvoice Packaged VAX 4000 Model 500 Systems

CL-45JS1-VA 8-line VAXserver system, VMS file and application license
CL-45JT1-VA 8-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 500
- BA440 pedestal enclosure
- Universal power supply
- 64 Mbytes of memory (MS690-CA)
- Two DSSI adapters and one Ethernet adapter on CPU
- RF35E-AA 852-Mbyte disk drive
- DTCN5-UG T1 upgrade kit
- DECnet end-node license
- DECvoice software license and TK50 media
- Hardware and software documentation

DECvoice Packaged VAX 4000 Model 500 Systems *(Continued)*

CL-45JS1-VB 24-line VAXserver system, VMS file and application license
CL-45JT1-VB 24-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 500
- BA440 pedestal enclosure
- Universal power supply
- 64 Mbytes of memory (MS690-CA)
- Two DSSI adapters and one Ethernet adapter on CPU
- RF35E-AA 852-Mbyte disk drive
- DTCN5-UG T1 upgrade kit
- Two DTC05-SA voice processing modules
- DECnet end-node license
- DECvoice software license and TK50 media
- Hardware and software documentation

CL-45JS1-VC 48-line VAXserver system, VMS file and application license
CL-45JT1-VC 48-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 500
- BA440 pedestal enclosure
- Universal power supply
- 64-Mbytes of memory (MS690-CA)
- Two DSSI adapters and one Ethernet adapter on CPU
- RF35E-AA 852-Mbyte disk drive
- DTCN5-UG T1 upgrade Kit
- Five DTC05-SA voice processing modules
- DECnet end-node license
- DECvoice software license and TK50 media
- Hardware and software documentation

CL-45JS1-VD 72-line VAXserver system, VMS file and application license
CL-45JT1-VD 72-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 500
- BA440 pedestal enclosure
- B400X-B9 expansion pedestal enclosure
- Universal power supply
- 96-Mbytes of memory (MS690-CA, MS690-BA)
- Two DSSI adapters and one Ethernet adapter on CPU
- RF35E-AA 852-Mbyte disk drive
- DTCN5-UG T1 upgrade kit
- Eight DTC05-SA voice processing modules
- DECnet end-node license
- DECvoice software license and TK50 media
- Hardware and software documentation

DECvoice Packaged VAX 4000 Model 600 Systems

CL-46JS1-VA 8-line VAXserver system, VMS file and application license
CL-46JT1-VA 8-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 600
- BA440 pedestal enclosure
- Universal power supply
- 64-Mbytes of memory (MS690-CA)
- Two DSSI adapters and one Ethernet adapter on CPU
- RF35E-AA 852-Mbyte disk drive
- DTCN5-UG T1 upgrade kit
- DECnet end-node license
- DECvoice software license and TK50 media
- Hardware and software documentation

DECvoice Packaged VAX 4000 Model 600 Systems *(Continued)*

CL-46JS1-VB 24-line VAXserver system, VMS file and application license
CL-46JT1-VB 24-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 600
- BA440 pedestal enclosure
- Universal power supply
- 64-Mbytes of memory (MS690-CA)
- Two DSSI adapters and one Ethernet adapter on CPU
- RF35E-AA 852-Mbyte disk drive
- DTCN5-UG T1 upgrade kit
- Two DTC05-SA voice processing modules
- DECnet end-node license
- DECvoice software license and TK50 media
- Hardware and software documentation

CL-46JS1-VC 48-line VAXserver system, VMS file and application license
CL-46JT1-VC 48-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 600
- BA440 pedestal enclosure
- Universal power supply
- 64-Mbytes of memory (MS690-CA)
- Two DSSI adapters and one Ethernet adapter on CPU
- RF35E-AA 852-Mbyte disk drive
- DTCN5-UG T1 upgrade kit
- Five DTC05-SA voice processing modules
- DECnet end-node license
- DECvoice software license and TK50 media
- Hardware and software documentation

CL-46JS1-VD 72-line VAXserver system, VMS file and application license
CL-46JT1-VD 72-line VAX timeshare system, VMS 1- to 10-user license

- Multiline DECvoice VAX 4000 Model 600
- BA440 pedestal enclosure
- B400X-B9 expansion pedestal enclosure
- Universal power supply
- 96-Mbytes of memory (MS690-CA, MS690-BA)
- Two DSSI adapters and one Ethernet adapter on CPU
- RF35E-AA 852-Mbyte disk drive
- DTCN5-UG T1 upgrade kit
- Eight DTC05-SA voice processing modules
- DECnet end-node license
- DECvoice software license and TK50 media
- Hardware and software documentation

Step 2—Storage

A minimum of 300 Mbytes of local disk storage is recommended for the VAX 4000 Model 300; one RF31E-AF 381-Mbyte disk drive is included with each system. A minimum of 200 Mbytes of storage is recommended for the VAX 4000 Model 200; one RF31F 200-Mbyte disk drive is included with each system. A minimum of 700 Mbytes of disk storage is recommended for the VAX 4000 Model 500/600 systems; one RF35E-AA 852-Mbyte disk drive is included with each system. If additional disk storage is required, refer to Chapter 7, *Storage Devices,* for ordering information.

A load device is required to load the Multiline DECvoice software and must be ordered separately (NOT included with the packaged system). The recommended load device is a TK70E-AF tape drive and is supported by the TQK70-SF tape controller which must also be ordered separately. For additional information, refer to Chapter 7, *Storage Devices.*

Step 3—Memory

A minimum of 1 Mbyte of memory per voice line is recommended. Each VAX 4000 Model 300 system includes a minimum of 32 Mbytes of memory (MS670-BA). The system can be expanded from 32 Mbytes to 224 Mbytes of memory using three 64-Mbyte modules (MS670-CA) and one 32-Mbyte module (MS670-BA). The VAX 4000 Model 200 system is shipped with a minimum of 8 Mbytes of memory (MS5650-BB) and can be expanded from 8 Mbytes to 64 Mbytes of memory using four 16-Mbyte modules (MS650-BF). VAX 4000 Model 500/600 systems require 64 Mbytes of memory (MS690-CA). To support 72-line configurations, an additional 32 Mbytes of memory (MS690-BA) is provided.

Step 4—Console Terminal/Monitor

A console device is necessary for the system to function. No monitor, terminal, printer, or cables are provided with the system; they must be ordered separately. Refer to Chapter 8, *Terminals and Printers*, for ordering information.

Step 5—Documentation

Documentation is included with each packaged system but must be ordered separately for the Field Upgrade options.

EK-DVMLS-IN	*Multiline DECvoice Hardware Installation Manual*
AA-LE86C-TE	*DECvoice Software Reference Manual*
AA-PB3HA-TE	*DECvoice Software Installation Manual*
QA-VFUAA-GZ	*DECvoice Software Documentation*

Step 6—Software

Software media is on TK50; a load device must be ordered separately.

QA-VFUAA-H5	Multiline DECvoice software media and documentation
QL-VFUA9-Jx	Multiline DECvoice software license
QT-VFUA9-Lx	Multiline DECvoice Software Product Services

Step 7—Continuous Word Recognition and Optional License

The DECvoice Continuous Word Recognizer is a separately licensed product that supplements the isolated word recognition capabilities of the base DECvoice software. The Continuous Word Recognizer documentation, binaries, and support are integrated into the base Multiline DECvoice distribution kit (QA-VFUAA-Hx).

QL-YFCAA-3B	Continuous Word Recognizer License. Activity license; contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.
QT-YFCAx-xx	Continuous Word Recognizer Services

Step 8—Expansion Information

The VAX 4000 Model 300/500/600 (BA440) pedestal cabinet provides seven available Q-bus slots. This configuration can support a maximum of one T1 module (DTCN5-AA) and six DECvoice modules (DTC05-SA) providing there are NO other Q-bus options installed. This configuration supports 48 lines. Adding additional voice processing modules or other Q-bus devices such as TQK70 (tape drive controller) require B400X-B9 expansion enclosure and CK-DTC05-AA expansion kit.

The VAX 4000 Model 200 (BA215) pedestal cabinet has four Q-bus slots available. This configuration can support a maximum of one T1 module (DTCN5-AA) and two DECvoice modules (DTC05-SA) plus a load device such as TK70 tape drive and TQK70 controller. This configuration supports 16 lines. No expansion cabinet is supported for Multiline DECvoice on this pedestal.

The VAX 4000 Model 200 (BA430) pedestal enclosure has ten Q-bus slots available. This configuration can support one T1 module (DTCN5-AA) and six DECvoice modules (DTC05-SA) for a maximum of 48 telephone lines in multiline mode. One additional DTC05-SA DECvoice module for single-line full-function mode (enhanced functionality) **OR** one load device such as a TK70 tape drive and TQK70 controller may also be installed. A 48-line configuration requires a total of 48 Mbytes of memory; an additional 32 Mbytes of memory or two Q-bus memory modules (MS650-BF) must be added. The maximum number of telephone lines supported in the BA430 pedestal is 48. Adding additional voice processing modules will exceed the VAX 4000 Model 200 Q-bus ac load limit and is not supported by DECvoice. No expansion cabinet is supported for Multiline DECvoice on this pedestal.

Step 9—Configuration Information

Requirements for adding Multiline DECvoice components (field upgrades) to a Q-bus MicroVAX 3000 series or VAX 4000 Model 300/500/600 system:

1. One Mbyte of memory per voice channel required:
   (e.g., one DTC05 module (eight channels) = 8 Mbytes of memory required.)
2. Maximum number of DECvoice modules (DTC05s) and telephone lines supported:

VAX 4000 Model 300/500/600	11 DTC05s (nine modules support 72 telephone lines in multiline mode, and two modules support single-line full-function mode for enhanced functionality).
VAX 4000 Model 200 (BA430)	Six DTC05s (six modules support 48 telephone lines in multiline mode or six telephone lines in the single-line full-function mode for enhanced functionality).
VAX 4000 Model 200 (BA215)	Two DTC05s (two modules support 16 telephone lines in multiline mode or two telephone lines in the single-line full-function mode for enhanced functionality).
MicroVAX 3800/3900	Nine DTC05s (six modules support 48 telephone lines in multiline mode, and three modules support single-line full-function mode for enhanced functionality).
MicroVAX 3500/3600 MicroVAX 3300/3400	Six DTC05s (three modules support 24 telephone lines in multiline mode, and three modules support single-line full-function mode for enhanced functionality).
	Note: Each DECvoice module requires one Q-bus slot.

3. Each system requires one T1 telephony module which requires one Q-bus slot.
4. Each system requires a storage device for recorded voice files.
5. Each system requires a load device for the DECvoice software.

Prerequisites:

- T1 telephone line (installed by local telephone company)
- VMS V5.3 or higher (V5.4-2 for VAX 4000-200)—VMS V5.5 for VAX 4000 Model 500/600
- DECvoice software license
- DECvoice media and documentation kit
- Monitor/terminal required (order separately)
- Load device required (order separately)
- System integration may be required:
  - Telephone system (e.g., PBX integration)
  - Channel bank
- 64 Kbytes of Q-bus I/O space is required for each T1 module and DTC05 module installed in the system.
- Power and bus loading constraints may reduce the maximum DTC05 configuration.
- The DTC05/DTCN5 modules are not distributed, nor shareable across nodes in the VAXcluster. The module must reside locally on the processor that performs the calls to the DECvoice libraries.
- The performance of the realtime portions of the system is sensitive to processor, VAXcluster, and device-interrupt latency. Degradations will be noticed if the DTC05/DTCN5 interrupts are blocked by any other software and/or hardware in the system. A dedicated VAX system is recommended for optimal DECvoice performance.
- The following DECvoice implementation services are available:
  - PBX integration
  - Technical consulting
  - Configuration support
  - Training

For services information, call the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

Multiline DECvoice Configuring Information

	Q-bus Slots	dc Load	ac Load	+5 V	+12 V	Watts
DTC05-SA	1	.75	3.6	4.0	0.0	15.8
DTCN5-UG	2	1.5	7.0	7.17	0.0	35.8

Chapter 5
VAXcluster Options/Systems Expansion

VAXcluster Systems Configuration Details

VAXcluster Multi-Datacenter Facility

VAXcluster Console System

VAXcluster Options

Memory

Easy System Upgrades

CPU Upgrades

Environmental Products

VAXcluster Systems Configuration Details

Overview

A VAXcluster system is one of Digital's most highly developed architectures to support the widest variety of corporate computing demands. A VAXcluster system is a loosely coupled configuration of computer elements or units and storage subsystems. A VAXcluster system appears as a single system to the user, whether the VAXcluster system is local or distributed among several sites. Multiple VAX systems can be linked together, regardless of their size and capacity. Peripherals, such as storage devices and printers, are shared. Site redundancy or site consolidation can be achieved using the VAXcluster Multi-Datacenter Facility. These various capabilities can be combined to install the level of computing power, availability, and datacenter consolidation required across the enterprise.

A VAXcluster system offers a stable and predictable computing environment. VAXcluster system design provides high performance, high data integrity, and high availability. The technology substantially reduces downtime and dramatically decreases—or even eliminates—the impact of the failure of an individual computing unit or subsystem component. A VAXcluster can be configured with increasing levels of availability, all the way to disaster tolerance.

VAXcluster systems provide the ability to add or vary computer performance and storage capacity by flexible increments. They support scalability, or increasing proportions, across several dimensions: range of availability, size of host processor, number of host processors, number of user stations, storage capacity, VAXcluster interconnect bandwidth, distance, and with the newest VAXcluster product—VAXcluster Multi-Datacenter Facility—geographically separated sites. A VAXcluster across multiple sites can offer disaster-tolerant platforms and/or consolidation of multiple datacenters.

A VAXcluster system maximizes an investment in computing resources, extends the life of existing systems, and can meet future growth needs. VAXcluster technology offers an economical means of expanding compute power and shared resources in gradual steps, where and when needed, by simply adding new VAX systems, VAXstations, and peripheral devices to the cluster as requirements grow. The most recent ability to link multiple sites in a single VAXcluster configuration extends VAXcluster functionality in a new dimension. In addition, a VAXcluster system allows simplification of system management through the ability to manage the VAXcluster system—host processors, user stations, shared resources, and multiple sites—as a single system.

VAXcluster systems represent a unique way to use many of Digital's architectures in combinations that meet customer needs for system and data availability. The commitment to VAXcluster technology means that a current VAXcluster configuration can incorporate future technological innovations.

VAXcluster Benefits

VAXcluster technology offers many benefits through a variety of configurations. These benefits include:

- Resource sharing of data, computes, printers, applications, backup capabilities
- Availability spectrum based upon the use of element redundancy to satisfy application requirements, for timesharing and client/server environments, or both
- Single system management domain including multiple computing units within a single locale or across multiple geographically dispersed sites
- Expandability of bandwidth, number of systems in the VAXcluster, storage devices, distance between systems or sites with no application rewrites
- Investment protection for growth and extension of CPUs, storage, and knowledge of MIS personnel and end users
- Disaster tolerance for predictable, reliable, short, and verifiable recovery from the loss of a computer facility (datacenter)

Configuring VAXcluster Systems

VAXcluster systems are configured with the following groups of components:

- **CPUs**—VAX and MicroVAX processors, from desktop systems to the VAX 10000 mainframe systems, can be computing units or members of a VAXcluster system.
- **Interconnects**—There are four types of interconnects that are currently used in VAXcluster configurations: CI, DSSI, Ethernet, FDDI.
- **Storage Subsystems**—There is a wide range of storage devices and technologies to meet the data storage needs of any size VAXcluster system.

The following table provides a simple positioning based on the four VAXcluster interconnects. These interconnects may be used in any combination.

VAXcluster Configurations

		DSSI				
	CI	VAX 10000/ 7000	VAX 6000	VAX 4000	Ethernet	FDDI
Maximum distance (meters)	90	25	25	20	2K[4]	40K
CPUs supported per bus	16	3	3	3	96	16
Service CPU online	Yes	Yes	Yes	Yes	Yes[1]	Yes
Service storage online	Yes	Yes	Yes[2]	Yes[2]	N/A	N/A
Reconfigure cluster while online[5]	Yes	No	No	No	Yes	Yes
Maximum and direct shareable storage	7 TB	288 GB	144 GB	48 GB	N/A	N/A
Bandwidth (aggregate Mbits/s per bus)	140	32[3]	32[3]	32[3]	10	100

[1] VAX 4000-300 and higher systems

[2] Service storage in supported warm-swap enclosures only, i.e., can "warm-swap" RF disks in SF35/72/73 storage building blocks, TF857 tape cartridge system, and all RF/TF ISEs in Model 400 series enclosures (BA44x, BA43x, R400X, B400X).

[3] VAX 10000 and VAX 7000 systems support up to 24 DSSI buses for total bus bandwidth of 96 Mbytes/second. VAX 6000 systems support up to 12 DSSI buses for total bus bandwidth of 48 Mbytes/second. VAX 4000-300 and higher systems support up to four DSSI buses for total bus bandwidth of 16 Mbytes/second.

[4] Total maximum distance (up to four segments at 500 meters each)

[5] Systems and storage devices may be added/removed from a CI VAXcluster while the VAXcluster continues. To add/remove systems in a DSSI VAXcluster requires shutting down the VAXcluster.

The next sections focus on the rules and configuration guidelines for each VAXcluster interconnect: CI, Ethernet, DSSI, and FDDI. The rules and guidelines included here are to assist in planning purchases. For configuration details, see *VAXcluster Systems: Guidelines for VAXcluster System Configurations,* and VMS Version 5.4-3 Release Notes.

All configuration rules conform to the VAXcluster Software Version 5.5 SPD. If a configuration is based on a different version of VMS, refer to the SPD for that version.

General VAXcluster Configuration Rules

The following rules apply for all VAXcluster configurations:

- Maximum number of CPUs supported in a VAXcluster system is 96.
- CPUs not supported in any VAXcluster configuration include VAXstation I, MicroVAX I, VAX-11/725, VAX-11/730, and VAX-11/782.
- CPU or storage controller may not participate in more than one VAXcluster system at a time.
- "Rule of Total Connectivity" must be met. This states that in a VAXcluster system, every CPU must be able to communicate directly with every other CPU. VAXcluster software does not perform routing for VAXcluster functionality.

General VAXcluster Configuration Rules
(Continued)

- DECnet-VAX communication path must exist between all nodes in a VAXcluster system.
- Single time zone setting must be used by all CPUs in a VAXcluster system.
- Multiple VAXcluster systems can be configured on a single Local Area Network (LAN).
- VAXcluster systems support four LAN adapters per CPU for VAXcluster communications. LAN segments can be bridged to form an extended LAN. The number of LAN adapters supported by each CPU is CPU dependent.

  If possible, any LAN-based VAXcluster configuration that includes Ethernet or FDDI should include multiple MOP and disk servers to enhance availability. When a server fails in configurations that include multiple servers, satellite access to disks fails over to another server. Disk servers should be the most powerful CPUs in the VAXcluster and should use the highest bandwidth LAN adapters available.

The following table shows the VAXcluster interconnects supported for VAX systems.

VAX Systems	CI	Ethernet	DSSI	FDDI
VAX 10000	X	X	X	X
VAX 9000	X	X		X
VAX 8xxx	X	X		
VAX 7000	X	X	X	X
VAX 6000	X	X	X	X
VAX 4000		X	X	
MicroVAX 3000 Q-bus		X	X	
MicroVAX 3100		X		

VAX-11/7xx, VAX 6000, VAX 8xxx, and VAX 9000 series CPUs require a system disk that is accessed via a local controller or through a local CI or DSSI connection. VAXcluster satellite booting is not supported for these systems.

Configuration Rules for CI VAXcluster Systems

Single CI Connections

- Maximum number of nodes that can be connected to a CI is 32. Maximum of 16 may be VMS systems; the other 16 may be HSCs.
- Dual porting of devices between an HSC and a local controller is not supported.
- TA-series tape drives may be dual ported between pairs of HSC subsystems with HSC Microcode Version 3.9 or higher.

Multiple CI Connections

If a VAX CPU can support more than one CI adapter, it can communicate through more than one Star Coupler. The following rules apply to multiple CIs and multiple Star Couplers. In addition to these rules, the general rules for VAXcluster systems and the rules for CI VAXcluster systems must be followed.

- Some CPUs can have multiple CI adapters.
- Different types of CI adapters cannot be mixed in the same CPU.
- Up to five Star Couplers can be used in a VAXcluster system.
- There is no requirement for a single Star Coupler through which all systems attached to the CI communicate, as long as total connectivity is maintained.
- Two VAXcluster configurations may not intersect. That is:
  - A CPU cannot be attached to two Star Couplers that are not in the same VAXcluster system.
  - A Star Coupler cannot be attached to two CPUs that are in different VAXcluster systems.
- Each CI adapter connected to the same Star Coupler must have a unique node number relative to that Star Coupler.
- Adapters in the same CPU may have the same node number **only** if they are connected to different Star Couplers.
- Storage devices cannot be dual ported between HSCs that are located on different Star Couplers or in different VAXcluster configurations.

With Multiple CI Connections
(Continued)

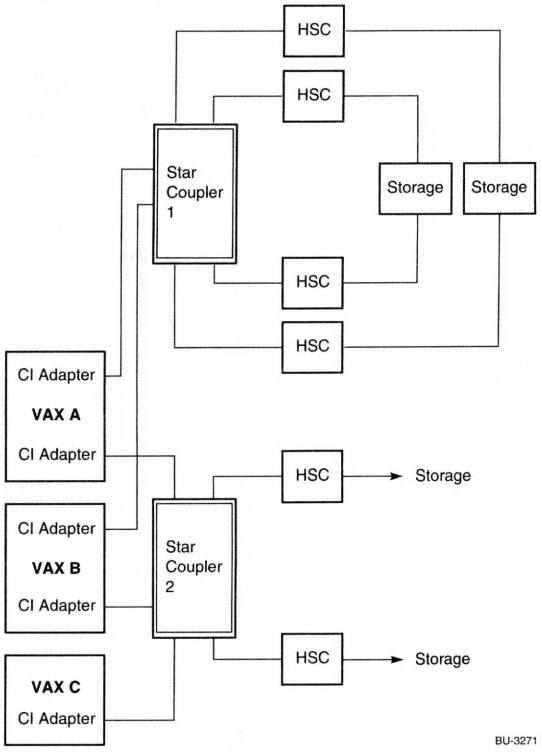
The following table shows the numbers of CI adapters allowed in specific types of VAXcluster nodes. A single node cannot have different types of CI adapters.

Maximum CI Adapters per VAXcluster CPU

CPU	CI750	CI780	CIBCI	CIBCA-A	CIBCA-B	CIXCD
VAX-11/750	1					
VAX-11/780		1				
VAX-11/785		1				
VAX 6000-XXX				1	4	4
VAX 7000						10
VAX 82XX,83XX			1	1	1	
VAX 85XX, 87XX, 88XX			1	1	2	
VAX 86XX		2				
VAX 9000-110/210/310/320*						4
VAX 9000-330/340/410/420*						8
VAX 9000-430/440*						10
VAX 10000						10

* A maximum of four CIXCDs per XMI bus is supported. However, a maximum of ten CIXCDs is the system limit on a VAX 9000.

The following diagram shows a multiple CI configuration. VAX A, VAX B, and VAX C have connections to Star Coupler 2. VAX A and VAX B also have connections to Star Coupler 1. VAX A or VAX B can MSCP serve data on storage devices that are connected by Star Coupler 1 to VAX C.



Configuration Guidelines for CI VAXcluster Systems

The following configuration guidelines are suggested for improved operation of a VAXcluster system:

- DECnet communications are required among all VMS systems in a VAXcluster operation (DECnet works on CI except through CIXCD).
- Two CI adapters (see table) may be configured, either for redundancy or for throughput. Throughput increase with a second CI adapter to the same Star Coupler is likely to be minimal. Increased throughput can be achieved by connecting the second CI adapter to a separate Star Coupler. The primary reason for having two CI adapters to the same Star Coupler is redundant access by the system.

  The Star Coupler is a passive device and is extremely reliable. It is not internally a single point of failure. Additional CI adapters and Star Couplers may be installed to improve system bandwidth, total computing power, total storage capacity, and higher availability.

Configuration Rules for DSSI VAXcluster Systems

Universal DSSI VAXcluster Configuration Rules

The following configuration rules apply to all DSSI VAXcluster configurations:

1.1 There must be at least two Q-bus MicroVAX/VAX systems or two VAX 6000, VAX 7000, VAX 10000 series systems in the VAXcluster configuration with each system having at least one DSSI adapter, whether embedded on the system module, connected via the Q-bus (KFQSA adapter), or connected via the XMI-bus (KFMSA adapter). See the *DSSI Adapters per System* table, for the type of adapter each system uses.

1.2 A maximum of three systems can be configured:

- Any combination of three Q-bus systems, as long as at least one is a VAX 4000 Model 300 or higher system
- Any combination of up to four VAX 6000, VAX 7000, VAX 10000 series systems
- Any combination to a maximum of three VAX 4000 and VAX 6000 systems
- With a minimum of one DSSI bus shared among all three systems

1.3 All systems connected to the same DSSI bus must be members of the same VAXcluster, each configured with a VMS license (VMS V5.4-3 or higher is required for three-system configurations), a VAXcluster software license, and a DECnet license (full-function DECnet is required on the first system). DSSI VAXcluster systems must also be connected by an Ethernet interconnect for DECnet communications. (DECnet communications are required for VAXcluster operation but are not supported over the DSSI bus.)

1.4 All systems connected to the same DSSI bus must have a common power/ground.

1.5 Each DSSI bus supports up to eight nodes. Each of the following counts as one DSSI node: a DSSI adapter; an RF-disk controller interface; a TF-tape controller interface. For a two-system DSSI VAXcluster system, for instance, a maximum of six RF-disks can be configured per DSSI bus: two system adapters + six disks = eight nodes.

1.6 Multiple DSSI adapters for each system are allowed, per the configuration restrictions as indicated in the *DSSI Adapters per System* table; each DSSI adapter in a single system must be connected to a different DSSI bus.

1.7 Each DSSI bus must be terminated at each end at all times; breaking the bus while a system is operational may lead to data corruption.

Configuration Rules for DSSI VAXcluster Systems *(Continued)*

1.8 The maximum DSSI bus length supported, i.e., the total distance between end-node terminators on the DSSI bus, is 25 m (82 ft) in a computer room environment, 20 m (65.6 ft) in an office environment.

These lengths are based on grounding conditions typically found in computer room and office environments. Improper grounding can result in voltage potentials, called ground offset voltages, between the enclosures in the configuration. If these voltages exceed certain limits, data transmission across the DSSI bus can be disrupted and the configuration can experience performance degradation or data corruption.

For these reasons, a common ground must be maintained between all systems/enclosures in a DSSI VAXcluster at all times. It is, therefore, necessary that all systems receive their power from a common power feed, i.e., it is not advisable to power systems/enclosures from different circuit breaker panels.

To verify site conditions, the following is strongly recommended:

1. Have a qualified electrician ensure that site power distribution meets all local electrical codes.
2. Also, have electrician inspect entire site power distribution system to ensure it does not have any of the following faults.
   - Outlets do not have power ground connections.
   - Grounding prong missing from computer equipment power cables.
   - Power outlet neutral connections are actual ground connections.
   - Grounds for the power outlets are not connected to the same power distribution panel.
   - Devices that are not UL or IEC approved are connected to the same circuit breaker as the computer equipment.

If these conditions have been met, ground offset voltages should be within acceptable limits.

The ground offset voltage limits are:

	Allowable Ground Offset Voltage	
Total DSSI Bus Length	**DC**	**AC (rms)**
Up to 20 m (65 ft)	200 mV	70 mV
20–25 m (65–82 ft)	40 mV	14 mV
27 m (89 ft) for four system VAX 6000, VAX 7000, VAX 10000 only	30 mV	10.5 mV

Ground offset voltages between enclosures can be measured after system installation to verify they fall within acceptable limits.

DSSI Adapters per System

VAX System	Embedded	KFQSA	KFMSA[1]	Buses
MicroVAX 3300/3400 (embedded EDA640)	1	2	–	3
MicroVAX II and MicroVAX 3500/3600/3800/3900	–	2	–	2
VAX 4000 Model 110 (embedded SHAC[2])	1	2[3]	–	3
VAX 4000 Model 200 (embedded SHAC[2])	1	2	–	3
VAX 4000 Model 300 and higher (embedded SHAC[2])	2	2	–	4
VAX 6000 Series	–	–	6	12
VAX 7000	–	–	12	24
VAX 10000	–	–	12	24

[1] Each KFMSA (XMI-to-DSSI) adapter contains two DSSI VAX system ports.
[2] Single Host Adapter Chip (SHAC)
[3] Requires a Q-bus expansion enclosure

MicroVAX and VAX 4000-Based DSSI VAXcluster Configurations

The following simplified rule may be used when configuring Q-bus DSSI VAXcluster systems:

2.1 **"The Q-bus 5-Enclosure Rule":** For Q-bus VAXcluster configurations, a maximum of five enclosures, *excluding* SF200/210/220s, can be configured on a single DSSI bus. That is, two systems and up to three expansion enclosures, or three systems and up to two expansion enclosures can be configured.*

See the *Q-bus Enclosure Characteristics* table for a summary of the storage capabilities provided by each enclosure-type and the cable connector-types which are associated with each enclosure.

Note that if other configurations are to be deployed (e.g., one with an SF200/210/220), then "Universal Length Rule 1.8" must be rigorously observed (to ensure signal integrity). For details on the use of "Universal Length Rule 1.8," see examples and the tables provided at the end of the DSSI VAXcluster Configurations Guidelines section.

* Note that only *one* SF100 is allowed on any DSSI bus in this set of DSSI VAXcluster configuration rules. (The TF857 and the SF7x used in a SF100 each count as one expansion enclosure.) The "Q-bus 5-Enclosure Rule" can only be applied with the use of the following cables: BC21M-09 and BC22Q-09 (both of which are 9-foot DSSI cables) and the BC21Q-3F, a 40-inch internal cable that is used to connect the TF857 to the SF7x inside the SF100.

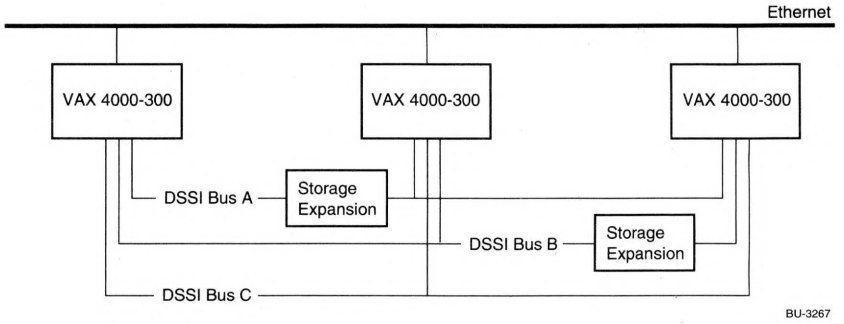
Q-bus Enclosure Characteristics

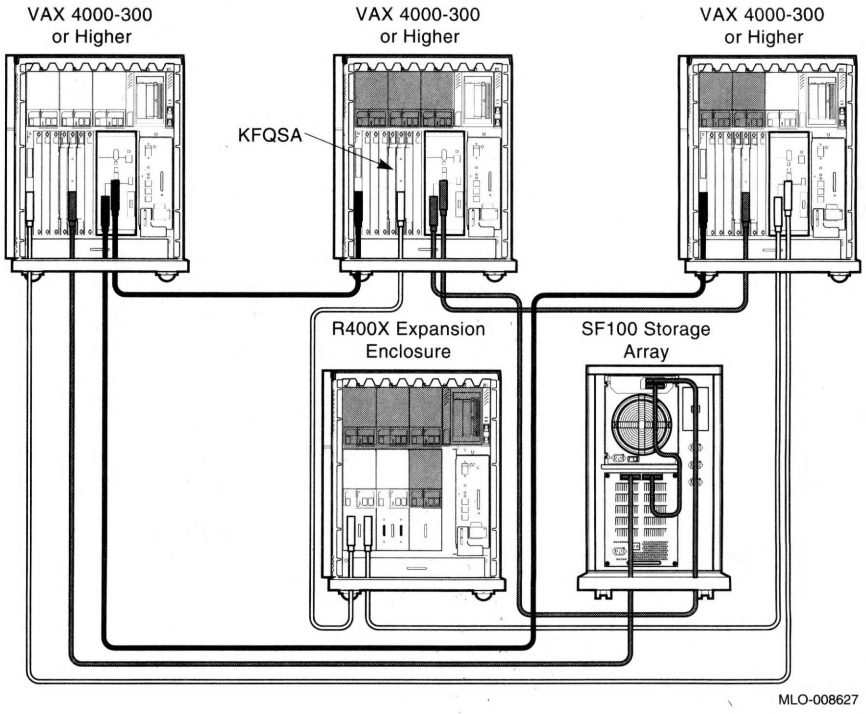
Enclosure	Number of Disks	Cable Connector-Type
BA440/441* VAX 4000-300[1] with RF35s	4 7	/PS Pedestal-style
BA430/431* VAX 4000-200 with RF35s	4 7	/PS
R400X* with RF35s	7 13	/PS
BA42B VAX 4000-100 with RF35s	3	/PS
B400X* with RF35s	4 13	/PS
SF100-SF72/73 with RF72/73s	2 or 4	/MR Midrange-style
SF100-TF857	1 (tape-only)	/MR
Tabletop TF85	1 (tape-only)	/MR
B213/213F	3	/PS
BA215	2	/PS
R215F	3	/PS
R23F	2[2]	/PS

* A tape ISE can be substituted for one disk.
[1] VAX 4000 Model 300 and higher systems
[2] EIC removable disk packs-only

MicroVAX and VAX 4000-Based DSSI VAXcluster Configurations
(Continued)

Three-System VAX 4000 Model 300 or Higher DSSI VAXcluster Configuration





Useful information on Q-bus DSSI VAXclusters

- The simplest two-system DSSI VAXcluster configuration has DSSI disks embedded in the system enclosures.
- Expanding from a single system to a two-system DSSI VAXcluster increases compute capacity, adds I/O capacity, and increases system availability.
- A minimum Q-bus DSSI VAXcluster configuration with any combination of MicroVAX 3300, 3400, 3800, or VAX 4000 series systems, all of which can accommodate internal DSSI storage, can be created.*
- The MicroVAX 3300 and 3400, as well as the VAX 4000 Model 200, each have one embedded DSSI adapter; the VAX 4000 Model 300 and higher systems have two embedded adapters.

* Some MicroVAX 3500 systems have embedded storage also.

MicroVAX and VAX 4000-Based DSSI VAXcluster Configurations
(Continued)

- Q-bus systems that do not support internal DSSI disk storage, e.g., MicroVAX II, can be integrated into a Q-bus DSSI VAXcluster configuration with the addition of a KFQSA storage adapter; RF-disks associated with that system are placed in the expansion enclosure for shared access.
- Any two MicroVAX or VAX 4000 systems can share an expansion enclosure.
- When sharing an R400X expansion enclosure between two systems in a DSSI VAXcluster configuration on a single DSSI bus, only six of the seven storage bays can be used (see Rule 1.5).
- The maximum configuration is determined by the number of DSSI adapters that can be configured on each system. The VAX 4000 Model 300 and higher systems have two embedded DSSI adapters. When two additional KFQSAs are added to the configuration, the maximum configuration becomes four shared DSSI buses. Note that the VAX 4000 Model 100/200 has one embedded adapter and supports a maximum of two additional KFQSAs; thus the VAX 4000 Model 100/200 supports a maximum of three shared DSSI buses. VAX 4000 Model 100 requires additional Q-bus expansion enclosure to house KFQSA adapter.
- A three-system Q-bus DSSI VAXcluster configuration can be created with any combination of Q-bus MicroVAX/VAX systems, as long as the "middle" node is a VAX 4000 Model 300 or higher system.

VAX 6000/7000/10000-Based DSSI VAXcluster Configurations

The following simple rule set may be used for VAX 6000 DSSI VAXcluster configurations:

3.1 "**The VAX 6000 Cabinet Rule**": For DSSI VAXclusters with any combination of two or three VAX 6000, VAX 7000, VAX 10000 systems it is recommended that the RF and/or TF storage ISEs residing on any single DSSI bus be housed in a single cabinet.

Note that if other configurations are to be deployed, then Universal Length Rule 1.8 must be rigorously observed (to ensure signal integrity). For details on the use of Universal Length Rule 1.8, see examples and the table provided at the end of the "DSSI VAXcluster Configurations Guidelines" section.

3.2 Up to two SF35, SF72, or SF73 storage array building blocks can be embedded inside the VAX 6000 system cabinet; each of the DSSI system ports on the KFMSA adapter can be connected to either an embedded SF35/SF72/SF73 or to an external SF200/SF210/SF220/SF300/SF400 storage cabinet. Note that embedded disks are shareable in a DSSI VAXcluster configuration.

3.3 VMS Version 5.4-2 or higher is required for the KFMSA adapter and VAX 6000 series DSSI VAXcluster configurations. VMS Version 5.4-3 or higher is required for booting VAX 6000 systems from the TF857 and TF85. VMS V5.5 is required to support VAX 6000 Model 600 systems; VMS V5.5-2 is required to support VAX 7000 and VAX 10000 systems.

SF72/SF73 Storage Arrays and SF100/SF200/SF210/SF220 Storage Cabinets

The following rules apply to SF72/SF73 storage arrays and SF100/SF200/SF210 storage cabinet configurations:

4.1 Each SF200/210 storage cabinet can include up to six SF72/SF73 storage arrays, each consisting of two or four RF72/RF73 disks; and up to two TF8xx magazine tape subsystems.

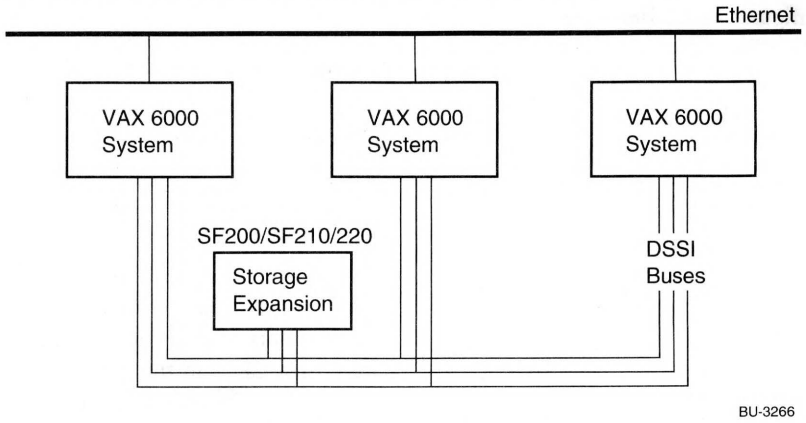
Each SF220 storage cabinet can include up to six SF35 storage arrays, each consisting of up to 12 RF35 disks and up to two TF8xx magazine tape subsystems.

4.3 Each SF72/SF73 storage array has two external DSSI interfaces and can include either two or four RF72/RF73 disks; these RF-disk pairs can be connected to either one or two separate DSSI buses.

Note: The new SF400 cabinet is recommended for use with the VAX 7000 and VAX 10000 systems. The SF400 storage cabinet is the same height as the new platforms and can hold 65 percent more RF disk capacity than the SF220.

SF72/SF73 Storage Arrays and SF100/SF200/SF210/SF220 Storage Cabinets *(Continued)*

Three-System VAX 6000 DSSI VAXcluster Configuration



Useful information on VAX 6000 DSSI VAXclusters

- Create a minimum, two-bus VAX 6000 DSSI VAXcluster system with any combination of VAX 6000 series systems, each configured with at least one KFMSA adapter, which supports two DSSI buses.
- The simplest two-system DSSI VAXcluster configuration has DSSI disks embedded in the system cabinet; each VAX 6000 system cabinet can accommodate up to eight RF72/73 disk drives and one TF85 tape drive, which are directly shareable between both systems.
- In a two-system VAX 6000 DSSI VAXcluster system, up to six RF72/73 disk drives (or four RF72/73 disk drives and one TF-tape drive) can be supported on each DSSI bus.

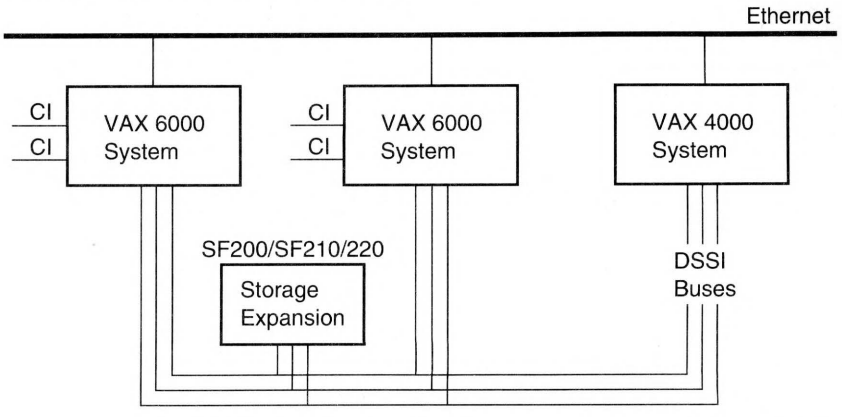
Mixed System DSSI VAXcluster Configurations

The following rules apply to mixed-system DSSI VAXcluster configurations:

5.1 VAX 6000 and VAX 4000 families can be connected to the SF100, SF200/210/220 storage cabinet or to the R400X and other selected expansion enclosures.

Note that, since the combination and permutation of mixed systems and DSSI storage expansion options is virtually unlimited, the "Q-bus five-Enclosure Rule" and "VAX 6000 Cabinet Rule" are not applicable; "Universal Length Rule 1.8" must be rigorously observed (to ensure signal integrity). For details on the use of "Universal Length Rule 1.8," see examples and the tables provided at the end of the DSSI VAXcluster configurations guidelines section.

Mixed System DSSI VAXcluster Configuration



Mixed System DSSI VAXcluster Configurations *(Continued)*

Useful information on Mixed System DSSI VAXclusters

- A mixed system DSSI VAXcluster configuration can be created with any combination of up to three VAX 4000 and VAX 6000 Series systems.
- A VAX 6000 series system can be added to an existing VAX 4000 family DSSI VAXcluster configuration **and** also be configured as a member of a CI VAXcluster; the VAX 6000 system then provides a "gateway" service, providing high-performance access to the CI VAXcluster datacenter-wide databases for the VAX 4000 systems.
- The VAX 6000 series system may be added to an existing two-system VAX 4000 family VAXcluster for applications that require vector processing, where the disk requirements exceed the configurability of the Q-bus VAXcluster, or where more than three CPUs in the cluster are required to meet future business growth needs—all without losing the investment in the existing Q-bus DSSI VAXcluster.

Configuration Guidelines for DSSI VAXcluster Systems

The following are recommended guidelines and considerations, when configuring a DSSI VAXcluster:

- Similar VAX systems should be connected on the same DSSI bus, whenever possible, to optimize performance.
- Different adapter types are allowed in the same system; similar adapters should be connected on the same DSSI bus whenever possible to maximize performance. (See the *DSSI Adapter Performance Characterization* table.) In conjunction with this configuration guideline, it is recommended that KFQSA-based Q-bus systems be upgraded to VAX 4000 Model 200 systems when included in VAX 4000 DSSI VAXcluster configurations.
- VAX 6000 series systems configured with KFMSA adapters may also be configured with CI adapters, simultaneously accessing data and resources in this mixed interconnect VAXcluster.
- VMS Volume Shadowing Phase II software can be added for increased data availability and redundancy.
- An optional Uninterrupted Power Supply (UPS) can be added to the VAXcluster configuration to increase the level of availability.

DSSI Adapter Performance Characterization

DSSI Adapter-type	Sustained I/O Rate (I/Os per second)
KFQSA	190
Embedded EDA640 (MicroVAX 3300/3400 systems)	360
Embedded SHAC (VAX 4000 systems)	1200*
KFMSA	1600

*For VAX 4000 Model 200 and VAX 4000 Model 300 systems SHACs, can only be driven to 800 IOs/second.

Configuration Guidelines for DSSI VAXcluster Systems *(Continued)*

Electrical Lengths of DSSI Bus Components*

Description/ Connector Types	Order Number	Length
3.5-foot intracabinet shielded cable used in SF200, SF210, SF220 and SF100 cabinets to connect between the drive enclosures SF72 and TF857/837 (MR/MR connectors)	**BC21Q-3F**	42 inches (3.5 ft, 1.06 m)
6-foot intracabinet shielded cable used in SF200/ 210/220 cabinets between drive enclosures and SF200/SF210/220 bulkhead (MR/MR-BH connectors)	**BC21R-5L**	70 inches (5.8 ft, 1.78 m)
9-foot external shielded cable (MR/MR connectors)	**BC21Q-09**	108 inches (9 ft, 2.74 m)
9-foot external shielded cable (MR/PS connectors)	**BC22Q-09**	108 inches (9 ft, 2.74 m)
9-foot external shielded cable (PS/PS connectors)	**BC21M-09**	108 inches (9 ft, 2.74 m)
16-foot external shielded cable (PS/PS connectors)	**BC21Q-16**	192 inches (16 ft, 4.8 m)
16-foot external shielded cable	**BC22Q-09**	192 inches (16 ft, 4.8 m)
25-foot external shielded cable (MR/MR connectors)	**BC21Q-25**	300 inches (25 ft, 7.62 m)
25-foot external shielded cable (MR/MR connectors)	**BC22Q-25**	300 inches (25 ft, 7.62 m)

* Electrical length may be different from apparent physical length by wide margins; for example: in a "Y" cable bundle the apparent physical length of the cable bundle is "a" feet but the electrical length is actually 2a between external connectors

Notes:

- MR is a micro-ribbon style external shielded connector; mates with MR-BH only.
- PS is a pin-and-socket-style external shielded connector; mates with PS-BH only.
- MR-BH is a micro-ribbon style shielded connector used for bulkhead mounting; mates with MR only.
- PS-BH is a pin-and-socket-style shielded connector used for bulkhead mounting; mates with PS only

Embedded DSSI Bus in VAX 6000 Enclosures

Description	Order Number	Length
4-foot intracabinet shielded cable used from XMI backplane with KFMSA to cabinet bulkhead in VAX 6000 (XMI-BP/MR-BH connectors)	**BC07T-04**	48 inches (4 ft, 1.22 m)
9-foot intracabinet shielded cable used from XMI backplane with KFMSA to cabinet bulkhead in special rackmount VAX 6000 (XMI-BP/MR-BH connectors)	**BC07T-09**	108 inches (9 ft, 2.74 m)
8-foot intracabinet "Y" shielded cables used from cabinet bulkhead to XMI backplane with KFMSA to cabinet bulkhead in VAX 6000 (MR-BH/XMI-BP/ MR-BH connectors)	**BC07W-08**	96 inches (8 ft, 2.43 m)
10-foot intracabinet shielded cable used from XMI backplane with KFMSA to internal TF interface board to cabinet bulkhead in VAX 6000 (XMI-BP/TFI/MR-BH connectors)	**BC07U-10**	124 inches (10.3 ft, 3.15 m)

Note: XMI-BP is a backpanel connector for the XMI backpanel.

Configuration Guidelines for DSSI VAXcluster Systems *(Continued)*

Electrical Lengths of Embedded DSSI Bus in Enclosures

Enclosure	Internal DSSI Bus Length
R400x through bus mode • No internal terminator • Up to seven drives both upper and lower rows • Two external PS-BH connectors	94.5 inches (7.875 ft, 2.40 m)
R400x split bus mode 1 • No internal terminator • Up to four drives on same bus—upper row only • Two external PS-BH connectors	66 inches (5.5 ft, 1.68 m)
R400x split bus mode 2 • No internal terminator • Up to three drives on same bus—lower row only • Two external PS-BH connectors	40 inches (3.33 ft, 1.02 m)
BA42B embedded storage • Has internal terminator • VAX 4000 Model 100 • One external PS-BH connector	26 inches (2.2 ft, .72 m)
BA440 embedded storage (Bus 0) • Has internal terminator • VAX 4000 Model 300 and higher • One external PS-BH connector	52 inches approximately (4.3 ft, 1.32 m)
BA440 in/out port (Bus 1) • No internal terminator • VAX 4000 Model 300 and higher • Two external PS-BH connectors	20 inches (1.6 ft, 0.51 m)
BA430 embedded storage • Has internal terminator • VAX 4000 Model 200 • One external PS-BH connector	54 inches (4.5 ft, 1.37 m)
BA213 • Has internal terminator • One external PS-BH connector	45 inches (3.7 ft, 1.14 m)
B213F • Has internal terminator • One external PS-BH connector	20 inches (1.6 ft, 0.51 m)
BA215 • Has internal terminator) • One external PS-BH connector)	30 inches (2.5 ft, 0.76 m)
R215F • No internal terminator • Two external PS-BH connectors	60 inches (5 ft, 1.52 m)
R23F • No internal terminator • Two external PS-BH connectors	39 inches approximately (3.3 ft, 1.0 m)
KFQSA adapter with one external PS-BH connector directly attached to KFQSA (e.g., BA440)	12 inches (1.0 ft, .33 m)
KFQSA adapter with two external PS-BH connectors directly attached to KFQSA (e.g., BA440)	12 inches (1.0 ft, .33 m)
SF72 or SF73 enclosure in through bus mode • 1–4 drives on same DSSI bus no internal terminator • Two external MR-BH connectors	168 inches (14 ft, 4.27 m)
SF72 or SF73 enclosure in split bus mode • 1 or 2 drives using internal SF72 terminator • One external MR-BH connector	83.5 inches (6.96 ft, 2.12 m)

Configuration Guidelines for DSSI VAXcluster Systems *(Continued)*

Electrical Lengths of Embedded DSSI Bus in Enclosures *(Continued)*

Enclosure	Internal DSSI Bus Length
Half-rack SF35 enclosure in through bus mode • 1–6 drives on same DSSI bus no internal terminator • Two external MR-BH connectors	84 inches (7 ft, 2.13 m)
Half-rack SF35 enclosure in split bus mode • 1–3 drives using internal SF35 terminator • One external MR-BH connector	42 inches (3.5 ft, 1.07 m)
TF857 or TF837 • No internal terminator • Two external MR-BH connectors	10 inches (0.83 ft, 0.25 m)

SF200/SF210/SF220/100: Cable lengths internal to the SF200/SF210/SF220/SF100 must be obtained by adding the intracabinet cable length to the lengths in the enclosures used (SF72 or TF857/837). Usually the SF100 has only a 3.5-foot intracabinet cable between the enclosures and the SF200/SF210/SF220 will have one or two 70-inch cables and possibly a 3.5-foot intracabinet cable; consider the specific implementation.

For example: an SF200 with the bulkhead connected to a through bus SF72 connected to a TF857 connected back to the bulkhead would have 70 + 167 + 42 + 10 + 70 = 359 inches (29.9 feet) internal to the SF200 cabinet.

Enclosures with no internal terminators may be used anywhere on the bus (end or middle). (If used on the bus end, an external terminator must be used on the enclosure.)

Enclosures with internal terminators *must* occupy bus end positions.

There are essentially three DSSI cable types used to connect various enclosures together in a DSSI cluster. The difference between these cables is essentially the style of connector used on each end. The Q-bus pedestal systems use one style of connector (P/S for pedestal style/pin socket) and the VAX 6000 systems use the M/R (mid-range/micro ribbon) style of connector. These two connector styles are **not** compatible with each other, thus three cable types are necessary.

BC21M-09	Pedestal-to-pedestal style cable
BC21Q-xx	Mid-range-to-mid-range style cable
BC22Q-xx	Pedestal-to-mid-range style cable

Today only the BC21M-09 and the BC21Q-3F are orderable via the cable number. The BC21M-09 is the pedestal-to-pedestal style DSSI cable used to connect Q-bus systems (e.g., VAX 4000 to VAX 4000) as well as pedestal DSSI expansion (R400X).

Order this cable by its cable number. The BC21Q-3F is the 40-inch cable used to interconnect SFxx and TF857 storage building blocks within SF2x0 and SF100 DECarrays.

Cable variants of BC21Q-xx and BC22Q-xx (where xx is the length in feet) must be ordered via cabinet kits.

For connecting between a VAX 6000 system and an SF2xx DECarray:

Cable Required	Cabinet Kit to Order
BC21Q-09	**CK-SF200-LM**
BC21Q-16	**CK-SF200-L5**
BC21Q-25	**CK-SF200-L3**
BC21Q-50	**CK-SF200-L7**

Configuration Guidelines for DSSI VAXcluster Systems *(Continued)*

For connecting between a VAX 4000 system and an SF2xx DECarray:

Cable Required	Cabinet Kit to Order
BC22Q-09	**CK-SF200-LP**
BC22Q-16	**CK-SF200-L6**
BC22Q-25	**CK-SF200-L4**
BC22Q-50	**CK-SF200-L8**

For connecting between a VAX 6000 and another VAX 6000, SF100 DECarray or tabletop TF85:

Cable Required	Cabinet Kit to Order
BC21Q-09	**CK-SF100-LM**
BC21Q-16	**CK-SF100-L5**
BC21Q-25	**CK-SF100-L3**

For connecting between a VAX 4000 and VAX 6000 system, SF100 DECarray or tabletop TF85:

Cable Required	Cabinet Kit to Order
BC22Q-09	**CK-SF100-LP**
BC22Q-16	**CK-SF100-L6**
BC22Q-25	**CK-SF100-L4**

Configuration Rules for LAN-Based VAXcluster Systems

Just as there are general rules for VAXcluster configurations, there are rules that apply to both Ethernet and Fiber Distributed Data Interface (FDDI) VAXcluster configurations. Ethernet and FDDI are industry-standard general-purpose communications interconnects that can be used to implement a Local Area Network (LAN). Rules specific to Ethernet or FDDI are in the separate sections. For network configuration details, see the *Networks Buyer's Guide.*

- A single extended LAN must link all CPUs.
- All LAN bridges must provide a low-latency data path, with approximately 10 Mbits per second throughput for Ethernet and 100 Mbits per second throughput for FDDI. Translating bridges must be used when connecting VAXcluster nodes on an Ethernet to those on an FDDI.
- An extended local area network (LAN) must be configured according to the guidelines in the *Networks Buyer's Guide.*

Configuring LAN-based VAXcluster Systems with Multiple LAN Adapters

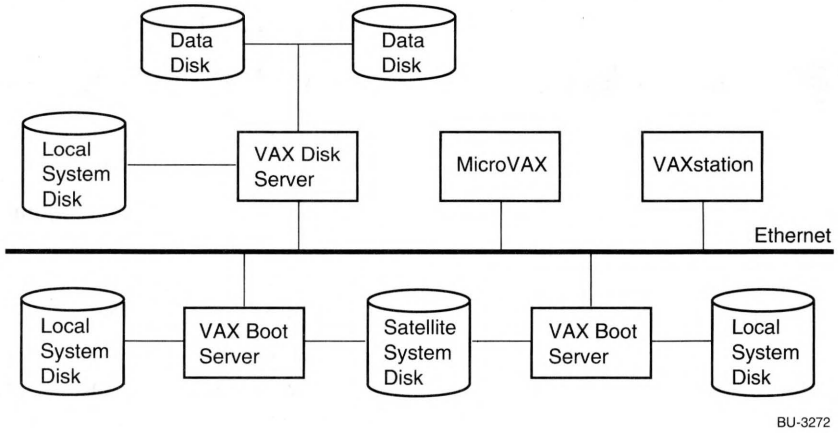
- All VAXcluster nodes should run VMS V5.4-3 or later.
- VMS V5.4-3 and higher support up to four Local Area Network (LAN) adapters on each local area VAXcluster system. Adapters can be either Ethernet or FDDI. LAN segments can be bridged to form an extended LAN. The LAN segments can be either Ethernet segments or FDDI rings.
- The boot server and the system disk server for a given satellite must be connected to the same LAN segment.
- All nodes must have a direct path to all other nodes. A direct path can be a bridged or unbridged LAN segment.
- Connect each LAN adapter to a separate LAN segment. A LAN segment can be bridged or unbridged. This can help provide higher performance and availability in the cluster.
- Distribute satellites equally among the LAN segments. This can help to distribute the cluster load more equally across all of the LAN segments.

Configuration Rules for Ethernet VAXcluster Systems

The following general rules apply for all Ethernet VAXcluster systems:

- CPUs that use the Ethernet for VAXcluster communications can use it concurrently for other network protocols that conform to the applicable Ethernet standards, such as Ethernet Version 2.0, IEEE 802.2, and IEEE 802.3.

The following diagram shows an Ethernet VAXcluster configuration with two VAX systems sharing disks across the DSSI. Both boot servers boot from locally connected system disks, and the disk containing satellite system roots is dual accessed (DSSI disks can not be dual ported) between the servers. Thus, if one boot server fails, satellites can access their system disk through the other server.



Configuration Rules for CPUs with Multiple Ethernet Adapters

When a LAN-based VAXcluster system is configured with high performance nodes, multiple LAN adapters and interconnects can be used to increase total communication bandwidth. When a VAXcluster system is configured with multiple Ethernet adapters, follow these rules:

- First determine the maximum number of Ethernet adapters supported by the CPU. A maximum of four LAN adapters per CPU is supported for VAXcluster communication.
- Each Ethernet adapter can be connected to a separate Ethernet LAN segment. This can help provide higher performance and availability in the VAXcluster system.
- Each Ethernet adapter can be connected to the same Ethernet LAN segment. This does not provide additional performance, but does provide higher availability.

Configuration Guidelines for Ethernet VAXcluster Systems

The following guidelines can help in configuring Ethernet VAXcluster systems.

- Ethernet bridges can be used to localize VAXcluster system traffic if overall network traffic is a concern.
- When choosing a CPU as a server, a general rule is to use the most powerful CPU with the highest bandwidth adapter.

For VAXcluster configurations that require even higher availability, use the following guidelines when you configure the VAXcluster system.

Ethernet LAN segments:

- Bridge Ethernet LAN segments together to form a single extended LAN.
- Provide redundant Ethernet LAN segment bridges for failover support.
- Configure LAN bridges to pass VAXcluster system and maintenance operation protocol (MOP) multicast messages.
- Use multiple boot or disk servers.

Configuration Rules for FDDI VAXcluster Systems

The Fiber Distributed Data Interface (FDDI) conforms to ANSI FDDI and IEEE LLC standards, and is an open protocol-independent interconnect. It can be used as a network interconnect, a VAXcluster interconnect, or as a common interconnect for both.

- CPUs that use an FDDI for VAXcluster communications can concurrently use it for other network protocols that conform to the applicable FDDI standards, such as ANSI X3.139-1987, ANSI X3.148-1988, and ANSI X3.166-1990.
- VMS V5.4-3 and higher support up to four Local Area Network (LAN) FDDI adapters (DEMFA) on each CPU within the VAXcluster system.
- The maximum number of VAXcluster members that can be directly connected to the FDDI, via the DEC FDDIcontroller 400 (DEMFA), is 16.

Configuration Rules for Mixed Interconnect VAXcluster Systems

The rules for mixed interconnect configurations are consistent with the rules for each individual interconnect.

For applications that require continuous processing with no loss of work in progress, a VAXft can be added to the environment with no application rewrite. VAXft fault tolerant systems may be used as standalone systems, as clustered fault-tolerant systems, or as a fault-tolerant front-end processor to a VAXcluster.

For businesses that require site independence, lights-out operation, or disaster recovery in seconds or minutes, see the following section, "VAXcluster Multi-Datacenter Facility."

VAXcluster Multi-Datacenter Facility

Overview

The VAXcluster Multi-datacenter Facility (MDF) is a software and consultancy package that provides the platform for disaster-tolerant computing. With MDF, system elements (CPUs, storage, etc.) located in two or more physically separated datacenters can be combined into a single, manageable VAXcluster system that has no single site dependency to be operational. Two system variations are currently supported:

- Two datacenters with a Quorum VAX at a third site provide resumption of system service within seconds after the loss of either datacenter without operator action.
- Two datacenters without a Quorum VAX provide resumption of service within minutes after the operator invokes the automated recovery procedures.

Both variations employ FDDI as the inter-datacenter communications media, providing site separation of up to 24.8 miles (40 km) and redundant (two) operations management stations (OMS) to provide site-independent system management.

The VAXcluster Multi-Datacenter Facility can also be used to consolidate datacenters and for lights-out operation allowing remote management of sites. For disaster tolerance, the recovery period/disaster-tolerant requirement is derived from the business or operational need being met.

- Critical computing functions such as those associated with health care or utility delivery (power, telephone, etc.) require virtually continuous system operation and cannot be dependent upon a single datacenter.
- The period of system outage directly correlates to a negative impact upon the bottom line for any business dependent upon computing functions and data access.
- Auditor and regulatory pressure to have a "fail safe" and verifiable disaster recovery plan is becoming the rule rather than the exception.
- Credible recovery plans may be required to obtain financing when the product or service delivered by the enterprise is dependent upon the computing system.
- Assured system availability can be used as a competitive advantage when marketing computing services.

Traditional disaster recovery techniques rely on manual procedures. Techniques such as offsite storage and standby systems are high risk, difficult, expensive to verify, and often go untested. The recovery period is typically specified in hours or days. Alternatively, applications can be written using remote journaling or other techniques. This disaster recovery technique is application dependent and is expensive to implement and maintain. The disaster-tolerant VAXcluster system is not application dependent and by making the recovery process intrinsic to the system's implementation, the "disaster recovery plan" is in continuous operation and, therefore, highly reliable, predictable, and easy to verify and costs less to implement and maintain than current disaster techniques.

In designing a disaster-tolerant VAXcluster system, the first decision to be made is whether recovery time must be in seconds (requires Quorum VAX and does not require operator action) or minutes (requires operator action and does not require Quorum VAX). The VAXcluster Multi-Datacenter Facility supports FDDI as the interconnect between sites. At least one XMI-based VAX (VAX 6000, VAX 7000, VAX 9000, or VAX 10000) equipped with a DEC FDDI Controller 400 connected to the FDDI ring must be located at each datacenter. The optional Quorum VAX can be any VAX (with system disk) connected to the FDDI ring via an FDDI/Ethernet bridge at a third location.

Overview *(Continued)*

In order to achieve a predictable, and short recovery period, physical datacenter independence must be assured. The MDF package provides the only way to do this reliably. Through the combination of software and service, datacenter independence is addressed in four dimensions: system management, system function, data correctness, and fault isolation/correction. Site-independent system management is provided by the deployment of two operations management stations (OMS), each to serve as backup to the other. The software that executes on the OMS VAXstation platforms is a combination of prerequisite system management products (see Step 3 of the following ordering menu) and additional utilities, code to integrate the various system management functions, code to effect OMS failover, customized command procedures, and event-monitor database provided with the MDF package.

Features

Operations Management Station (OMS) Software

- Location-independent, integrated system management functions
  - Management station security management
  - Configuration display monitor—current and expected views of VAXcluster system
  - OMS installation and customization tools
  - OMS platform failover
  - Integrated system management menus
- Customized command files for location-independent system operation
  - System startup
  - Restart after site failure
  - Re-combine VAXcluster after site repair
  - Shared resource redeployment
- Customized command files for location-independent storage management
  - Shadow set mount
  - Mark invalid shadow members for shadow copy only use
  - Shadow set reconstruction
- Site-independent failure isolation procedures
  - Event-monitor database (applied to VCS and DCM)
  - 24 "indications" mapped to isolation/correction procedures

Service and Documentation

- System availability analysis/configuration verification
- MDF implementation plan
- Command procedure customization
- OMS software customization
- Training on use of OMS
- Disaster-readiness checklists
- System test-recovery verification

Warranty

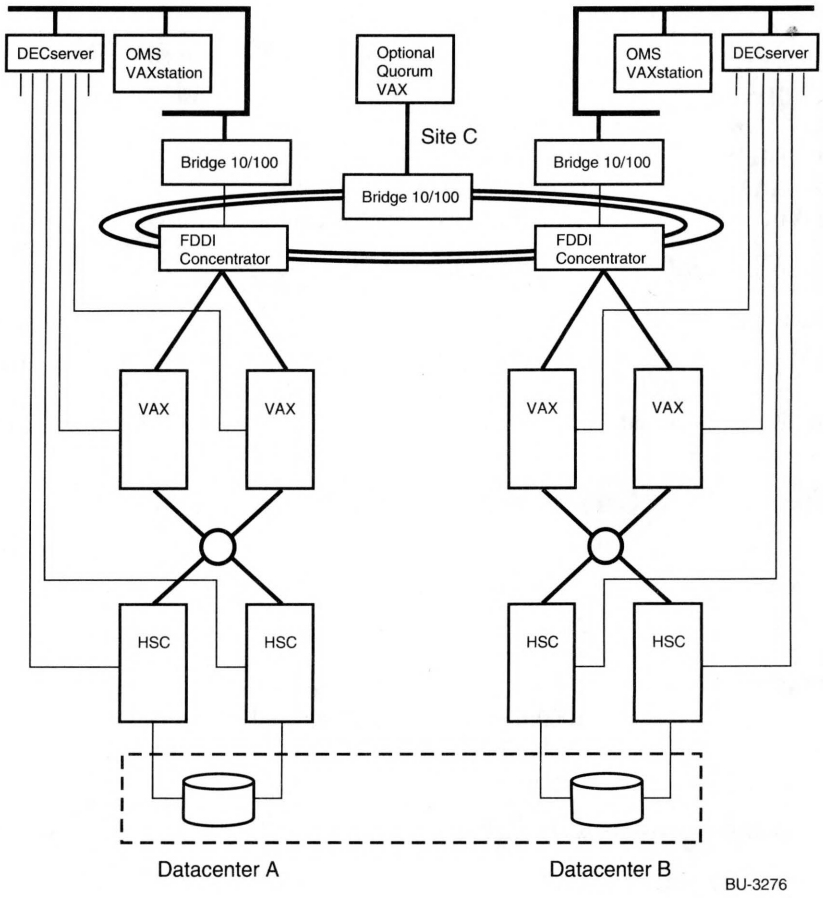
- VAXcluster MDF provides disaster-tolerant system availability and is a Digital-supported system solution—from design to online.

A VAXcluster Multi-Datacenter system may include up to:

- Two datacenters with or without a Quorum VAX at a third location (a future release will support three datacenters)
- A maximum of 16 VAX CPUs (VAX 6000, VAX 7000, VAX 9000, or VAX 10000) directly attached to an FDDI ring through a DECconcentrator and a DEC FDDI Controller 400 (XMI-FDDI interface) in the entire MDF VAXcluster system.
- One or two FDDI rings between location with load balancing and failover between rings.
- VAX systems with multiple FDDI interfaces per VAX CPU (up to four FDDI interfaces per VAX 9000-4xx; up to two per VAX 6000 and VAX 9000-200 and up to eight per VAX 7000 and VAX 10000).
- 96 nodes in the total VAXcluster system (including workstation and Hierarchical Storage Controllers).
- 75 two- or three-member shadow sets.

Additional configuration information is contained in *VAXcluster Multi-Datacenter Facility Configuration Guidelines* (order number AA-PKR9A-TE).

Disaster-Tolerant System



Step 1—VAXcluster Multi-Datacenter Facility

Order VAXcluster Multi-Datacenter Facility package.

QB-MC8AA-BA	VAXcluster Multi-Datacenter Package (one per datacenter included in multi-datacenter system)
QA-MC7AA-HW	Media and documentation kit (one per multi-datacenter system)

Step 2—VAXcluster Multi-Datacenter Facility Hardware/Software Platform

Order appropriate VAX 6000/VAX 7000/VAX 10000 system, including DEC FDDI Controller 400 controller (DEMFA) option.

Ensure that the prerequisite software is on the VAXcluster system:

QL-001xx-xx	VMS V5.4-3 or V5.5 for all nodes in the VAXcluster system
QL-VBRAx-xx	VAXcluster Software V5.4-3 for all nodes in the VAXcluster system
QL-AB2Ax-AA	VAX Volume Shadowing V5.4-3 for all nodes in the VAXcluster system
QL-D05xx-xx	Full-function DECnet (on at least one node/site)
Q2-GABAx-AA	Datacenter Monitor Watchdog R3.0 for each VAX system

Both multi-mode and single-mode FDDI fiber between datacenters are supported. Note that there must be a "reliable link" between the datacenters; e.g., there should be more than one physical path between the datacenters. This may be accomplished in several ways: diverse path routing with a dual ring, diverse path routing with two single rings, diverse path routing with two dual rings, and single path with a three-site (or two datacenter, plus Quorum VAX) configuration.

See the *Network Buyer's Guide* for details on configuring an FDDI network.

Step 3—OMS Hardware/Software Platform

Two Operation Management Station (OMS) systems are required in a VAXcluster Multi-Datacenter system: an OMS should be installed at each of the datacenters in the VAXcluster Multi-Datacenter system. The recommended OMS platform is a VAXstation 4000 VLC, VAXstation 4000 Model 60, or VAXstation 3100 Model 48. Each OMS requires a minimum of 16 Mbytes of memory and 300 Mbytes of disk storage. The display must have 8-plane color graphics, 1024 × 864 video resolution, a pointing device, and support DECnet.

Order the prerequisite software for each Operations Management Station:

QL-001xx-xx	VMS V5.4-3 or V5.5 (multi-user license)
QL-YFPxx-xx	DECelms V1.1
QL-VDHA9-AA	Terminal Server Manager (TSM) V1.5
Q2-GAAAx-AA	Datacenter Monitor Kernel R3.0
QL-V01AA-3B	VAXcluster Console System V1.3 for each VAX system, HSC, and OMS station

Step 4—OMS Console Interfaces

Select appropriate terminal servers and choose appropriate adapters to connect VAX systems and HSCs to the OMS console.

H8575-A	DECserver 200/MC (DRSVB-AA, AB) with modem control DECserver 200/DL (data leads, DSRVB-AA/AB)
No adapter required	DECserver 300* (DSRVF-BA, BB), DECserver 90L*, DECserver 90TL*

* MMJ connection

Step 5—OMS Console Cables

Choose appropriate cable length or customize cable length required to connect each VAX system and HSC to the OMS console.

BC16E-25	25-ft (7.6-m) DECconnect cable
BC16E-50	50-ft (15.2-m) DECconnect cable
BC16E-A0	100-ft (30.5-m) DECconnect cable
H8240	1000-ft (300.5-m) unterminated roll of DECconnect cable
H8220	Package of 50 MMP connectors
H8241	Crimping tool

Step 6—OMS Console Cable Adapters

H8575-A (25-pin)	VAX 9000, VAX 6000-2xx/3xx/4xx series, VAX 8xxx, VAX-11/750/780/785, HSC40/50/60/70/90
H8575-B (9-pin)	MicroVAX II, VAXstation II
No adapter required	MicroVAX 3xxx* series, VAXstation 3xxx* (except VAXstation 3200), VAX 4000 series*, VAXstation
*MMJ connection	4000 series*, VAXserver 3xxx*, VAXserver 4000 series*

VAXcluster Console System

Overview

The VAXcluster Console System (VCS) is a system management tool that centralizes the console management of dispersed nodes. VCS is a VMS V5.4 DECwindows layered product, and utilizes various MicroVAX and VAXstation systems as hardware platforms.

The VAXcluster Console System Software components include I/O data logger, data scanner, event logger, central control coordinator interface, monitor interface, connect interface, record interface, review interface, access interface, configuration editor, configuration file, and log files.

From VCS, a system manager can perform all console functions for all serviced nodes including:

- Shutting down or rebooting the serviced nodes.
- Running standalone diagnostics.
- Performing standalone backup operations.
- Installing layered products.
- Viewing console output.
- Reviewing historical console data.
- Retrieving historical console data for analysis or printing.
- Searching for console data.
- Logging all data and activities between VCS and the serviced nodes.
- Scanning incoming messages from the serviced nodes for specific text strings that may contain status or error information.
- Assembling icons into graphic displays on a VAXstation screen representing the aerial view of the datacenter and the logical grouping of VAXcluster configurations.
- Providing an optional security facility to control access to the serviced nodes.

Software Features

- All data received from connected devices are logged by VCS and identified by source node name and the time received by VCS.
- A security facility allows the system manager to restrict access to VCS-controlled devices.
- VCS detects console events by scanning console text messages and comparing them with predefined text strings contained in scan files.
- With VAXstation host systems, VCS can build an icon-based view of all the devices connected to it. This graphic layout uses color to indicate the severity of an event and allows the user to access a device's console by clicking with a mouse to activate a VCS interface.
- Users are alerted of critical system messages by changing icon colors, via a DECtalk device, VAXmail, terminal broadcast, notification window on VAXstations and DECwindows terminals, or user-defined.

Hardware Features

- Support of up to 32 devices: VAXcluster system nodes, standalone VAX systems, or any device that sends ASCII data over an RS-232 line, has an EIA console port, and supports XON/XOFF and I/O buffering. The maximum supported console terminal speed is 9600 baud.
- Operators can connect to the console port of any node serviced by VCS from any terminal connected to the VCS host.
- VCS can control remote devices via reverse LAT connections over the Ethernet using DECserver 200/300 terminal servers.
- Operators can remotely access the VCS host system via DECnet, LAT, or dial-up ports to perform VCS functions.
- Managed devices can connect to DECconnect via a terminal server or at the VCS host hardware platform.

VAXcluster Console System

Step 1—VAXcluster Console Software

Order VAXcluster Console System software.

QL-V01AA-3B	1-node license; order as many as needed. A maximum of 32 nodes can be connected.
QA-V01AA-H5	TK50 media and documentation
QA-V01AA-HM	Magtape media and documentation

Step 2—Hardware Platform

The following hardware platforms are supported. Refer to the appropriate chapter in this catalog for ordering new systems. A minimum of 6 Mbytes memory and 71 Mbytes of disk storage is required. If utilizing DECwindows, a minimum of 8 Mbytes of memory and 159 Mbytes of disk storage is recommended.

No. Nodes Connected	Host Hardware Platform	Connection Method
1–8	MicroVAX 2000 VAXstation 2000	Host-initiated connection
1–16	MicroVAX II VAXstation II/GPX VAX 4000	Direct connect or host-initiated connection
1–32	VAX 4000 MicroVAX 3300, 3400, 3500, 3600, 3800, 3900 VAXstation 3200, 3500	Direct connect or host-initiated connection
	VAXstation 3100, MicroVAX 3100	Host-initiated connection only

Step 2a—Direct Connection Method

For managed devices that are directly connected to the VCS host hardware platform, order the appropriate adapters.

H8575-A	MicroVAX II (DHV11, DHQ11 interface) MicroVAX 3300, 3400, 3500, 3600, 3800, 3900 (CXY08 interface) VAXstation 3500 (CXY08 interface)
No adapter required * MMJ connection	MicroVAX 3300, 3400, 3800, 3900 (CXA16 interface)* VAXstation 3200, 3500 (CXA16 interface)*

Step 2b—Host-initiated Connection

For managing devices that are elsewhere on the network, use terminal servers and choose appropriate adapters.

H8575-A	DECserver 200/MC (DSRVB-AA, AB) with modem control
No adapter required * MMJ connection	DECserver 300* (DSRVF-BA, BB) DECserver 200/DL (data leads, DSRVB-AA/AB)

Step 3—Cables

Choose appropriate cable length or customize cable length required.

BC16E-25	25-ft (7.6-m) DECconnect cable
BC16E-50	50-ft (15.2-m) DECconnect cable
BC16E-A0	100-ft (30.5-m) DECconnect cable
H8240	1000-ft (300.5-m) unterminated roll of DECconnect cable
H8220	Package of 50 MMP connectors
H8241	Crimping tool

Step 4—Adapters

Order the appropriate adapter for each of the following managed devices.

H8575-A (25-pin)	VAX 9000, VAX 6000-2xx/3xx/4xx Series, VAX 8xxx, VAX-11/750/780/785, HSC40/50/70
H8575-B (9-pin)	MicroVAX II, VAXstation II
No adapter required * MMJ connection	MicroVAX 3xxx* Series, VAXstation 3xxx* (except VAXstation 3200), VAXserver 3xxx*

VAXcluster Options

VAXcluster systems based on the Computer Interconnect (CI) offer high availability and performance through the CI's dual-path design, with 140-Mbit/second speed on both CI paths. These VAXcluster systems use VAXcluster Software on VMS systems with CI hardware:

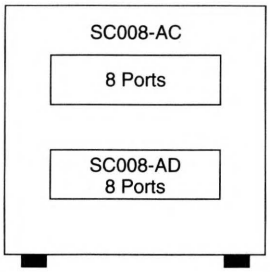
- CI VAXcluster hubs—Star Coupler and CI Star Coupler Expander (CISCE)
- CI interfaces—CIXCD-AA, CIXCD-AB, CIXCD-AC, and CIBCA-BA
- CI cables

VAXcluster configurations have been expanded with support for:

- Multiple Star Couplers and/or CI Star Coupler Expanders in a single VAXcluster system
- Multiple CI interfaces on most VAX processors in a VAXcluster system

Configuration guidelines are found in *Guidelines for VAXcluster Systems Configurations* (EK-VAXCS-CG).

Star Coupler



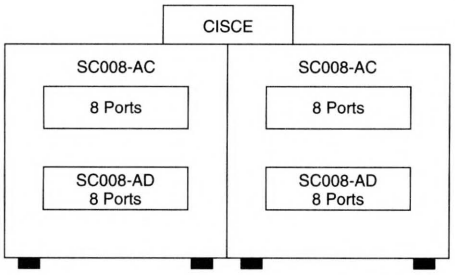
BU-3053

SC008-AC The SC008-AC is a passive hub device providing dual CI path and electrical isolation between CPU nodes and HSCxx storage controller nodes in a CI VAXcluster system. Supports up to eight CI ports; includes cabinet.

Dimensions: Width: 54 cm (21.25 in.)
Height: 106 cm (41.75 in.)
Depth: 76 cm (30.00 in.)

SC008-AD Upgrades the SC008-AC from support of 8 to 16 ports and is installed inside the SC008-AC cabinet.

Star Coupler Expander



BU-3054

CISCE-AA The CISCE Star Coupler Expander permits up to 32 ports to be connected to the Computer Interconnect, providing room to grow from the previous 16-port limit to 32 for larger installed CI-VAXcluster systems. It is used in combination with two SC008-ACs and two SC008-ADs for 32 CI interfaces, or two SC008-ACs and one SC008-AD for 24 CI interfaces. Each of the two amplifier assemblies that comprise the CISCE-AA has the following dimensions:

Dimensions: Width: 43.1 cm (17.0 in.)
Height: 8.73 cm (3.44 in.)
Depth: 29.7 cm (11.7 in.)
Voltage: 120/240 ac
Power: 6 W (continuous)

CI Interfaces

CI interfaces are intelligent controllers that connect nodes to the CI. Each interface attaches to the CI Bus, the bus consisting of two transmit and two receive cables (which provides hardware redundancy and fail-over). In the past, traffic on the CI Bus was restricted to transmissions on one available path at a time. With the introduction of the CIXCD, greater utilization of the CI Bus occurs with the controller taking advantage of both paths of the CI Bus for communications. Transmission can now be made across either available path simultaneously. The CI Bus retains its high availability since, if one path becomes unavailable, all traffic will use the surviving path. The VMS operating system tests a failed path periodically. As soon as the path becomes available it is automatically used again for normal traffic.

VAXcluster Options

CIXCD

High-performance, intelligent I/O interface that connects VAX 6000, VAX 7000, VAX 9000, and VAX 10000 series processors to the Computer Interconnect (CI) VAXcluster systems. It uses a method of CI communications that allows the CIXCD to communicate over two CI paths at the same time in any order. It is compatible with existing VAXcluster systems port interfaces and can be used to enhance existing VAXcluster systems I/O performance. It is supported by VMS V5.4. Combining CIXCDs and CIBCAs on the same system is not supported.

CIXCD-AA	CIXCD with cabinet kit for use on VAX 9000 system.
CIXCD-AB	CIXCD with cabinet kit for use on VAX 6000 system.
CIXCD-AC	CIXCD with cabinet kit for use on VAX 7000 and VAX 10000 system.

Option	Mounting Requirements	I/O Panel Units
CIXCD-AA/AB	1 XMI slot	2

CIBCA

CIBCA-BA Optional CI VAXcluster interface for VAXBI systems. VMS V5.4 supports the use of multiple CIBCA-BA interfaces on VAXBI-based systems, providing the interfaces are of the same type. VMS restricts the use of mixed CI port interface variations, e.g., the CIBCA-BA and the CIBCA-AA cannot be mixed within the same system.

Option	Mounting Requirements	dc Amps Drawn @					VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V		
CIBCA-BA	2 VAXBI slots	9.00	0.00	0.00	2.00	1.00	1	2

CI Cables

CI cables are required for each CI interface ordered.

BNCIA-10	CI cable set—10 meters (32 feet)
BNCIA-20	CI cable set—20 meters (65 feet)
BNCIA-45	CI cable set—45 meters (146 feet)

VAXcluster System License

A VAXcluster software license is required for each CPU in a VAXcluster system.

Configuration Support Table

	Supported with VMS V5.2	Supported with VMS V5.4
CI interfaces/Star Coupler	24 (with CISCE)	32 (with CISCE)
CI-based VAX CPUs/VAXcluster System[2]	16	16
Total VAX CPUs/Mixed Interconnect VAXcluster System[2]	96	96
Star Couplers/VAXcluster System	1	5[1]
CIXCD/VAX 9000-110, 210, 310, 320 System[3]	0	4
CIXCD/VAX 9000-330, 340, 410, 420 System[3]	0	8
CIXCD/VAX 9000-430, 440 System[3]	0	10[1]

Number of CI Interfaces Supported by CPU

	CI750	CI780	CIBCI	CIBCA-A	CIBCA-B	CIXCD
VAX-11/750	1	–	–	–	–	–
VAX-11/780, 785	–	1	–	–	–	–
VAX 82xx, 83xx	–	–	1	1	1	–
VAX 85xx, 8700, 88xx	–	–	1	1	2	–
VAX 86xx	–	2	–	–	–	–
VAX 6000 systems	–	–	–	1[4]	4[5]	4
VAX 7000 systems	–	–	–	–	–	10
VAX 9000-110, 210, 310, 320	–	–	–	–	–	4
VAX 9000-330, 340, 410, 420	–	–	–	–	–	8
VAX 9000-430, 440	–	–	–	–	–	10[1]
VAX 10000 systems	–	–	–	–	–	10

Notes:

[1] Architectural limit is 16; initial limits to be increased as testing and qualification proceed.
[2] CPUs may be single- or multiprocessor and may be connected by Computer Interconnect (CI), Ethernet, and/or DSSI. As of V5.4, CPUs are classified as workstations or other VAX types. During V5.2, CPUs were then classified as CI-based or non-CI based CPUs.
[3] All CI interfaces on a particular CPU must be of the same type.
See the *Guidelines for VAXclusters System Configurations*, EK-VAXCS-CG-004, for further information.
[4] CIBCA-A not supported on Model 500 and Model 600 systems.
[5] CIBCA-B not supported on Model 600 systems.

VAXcluster Revision Matrix to Support CIXCD

Note: The following matrix indicates the minimum revision levels required to support the CIXCD in a CI VAXcluster environment (current at the time of publication of this catalog). Consult Digital Services for the latest revision levels. All CI adapters in the cluster must be set to 10 tick mode when CIXCD is installed on any system in the cluster.

Element	All VAXcluster CI Nodes Numbered 0 – 15	All VAXcluster CI Nodes Numbered 0 – 31
VMS	V5.4	V5.4
CIXCD		
T2080	Rev E02 or above	Rev E02 or above
CIXCD.BIN	V2.03	V2.03
HSCx0		
Link Module	L0100 Rev E L0118 Rev B	L0118 Rev B
HSC s/w* for		
HSC50	V4.1	V4.1
HSC40/70	V6.0	V6.0
CI7x0, CIBCI		
Link Module	L0100 Rev E L0118 Rev B	L0118 Rev B
CI780.BIN and L0101	Rev 8.7 and L0101 Rev K or Rev 20.20 and L0101-YA	Rev 20.20 and L0101-YA
CIBCA-A		
Link Module		
Port Module	No Restriction	No Restriction
CIBCA.BIN	Rev 7.5	Rev 7.5
CIBCA-B		
Link Module		
Port Module	No Restriction	No Restriction
CIBCB.BIN	Rev 5.2	Rev 5.2

*Later versions of operating systems and affiliated devices such as HSCs may require higher versions than those stated above. Refer to applicable release notes.

VAX 7000 and VAX 10000 Memory

MS7AA-AA	64 Mbytes of memory; memory does not support intra-board interleaving.
MS7AA-BA	128 Mbytes of memory; memory supports two-way, intra-board interleaving.
MS7AA-CA	256 Mbytes of memory; memory supports two-way, intra-board interleaving.

VAX 9000 Series Memory

MS900-BA	256-Mbyte ECC MOS memory using 1-Mbit DRAMs; mounts in memory backplane in SCU cabinet. System memory capacity is 512 Mbytes.
MS900-UA	128-Mbyte to 256-Mbyte memory upgrade for VAX 9000 Models 110 and 310 only.

Recommended Memory Configuration

The VAX 9000 system requires sufficient memory capacity and bandwidth to match its processing capabilities and application demands. Insufficient memory can result in excessive paging and swapping and long memory I/O command queues. Memory is especially important for vector processors because they typically generate a high level of memory activity. The following chart shows the recommended memory configurations for VAX 9000 processors.

	Non-Vector		Vector	
Model	**Amount**	**Interleaving**	**Amount**	**Interleaving**
210/410	256 MB	2-way	256 MB/512 MB	2-way or 4-way
420	512 MB	4-way	512 MB	4-way
430	512 MB	4-way	512 MB	4-way

Note: Systems configured with 256 Mbytes of memory are capable of 2-way interleaving while systems configured with the MS900-BA (512 Mbytes total memory) can perform 4-way interleaving.

These are guidelines only. Application demands are important in determining the optimum amount of physical memory for a VAX 9000 system. A general VMS guideline states that additional memory is required when a system incurs ten or more page faults per second. It is desirable, in many cases, to configure sufficient physical memory to operate at a level significantly below ten page faults per second. Vector processor performance is especially sensitive to excessive paging.

VAX 6000 Series Memory

MS65A-BA	32 Mbytes, ECC, 1-Mbit DRAM memory; requires VMS V5.4.
MS65A-CA	64 Mbytes, ECC, 4-Mbit DRAM memory; requires VMS V5.4.
MS65A-DA	128 Mbytes, ECC, 4-Mbit DRAM memory; requires VMS V5.4.
MS62A-AB	32 Mbytes, ECC, 1-Mbit DRAM memory.

Note: MS62A-AB memory is not supported in VAX 6000 Model 500/600 systems. Recommended for VAX 6000 systems running VMS versions prior to VMS V5.4.

Memory Interleaving

Number of Processors	Recommended Minimum Interleave			
	Model 200	Model 300	Model 400	Model 500/600*
One	One	One	One	One
Two	One	One	One	One
Three	One	One	Two	One
Four	Two	Two	Two	Two
Five	Two	Two	Four	Two
Six	Two	Two	Four	Two
One with one vector	–	–	Two	One
Two with one vector	–	–	Two	Two
Two with two vectors	–	–	Four	Two
Three with one vector	–	–	Four	Two
Four with one vector	–	–	Four	Two

* The interleave requirements for the VAX 6000 Model 500/600 are less than specified for the VAX 6000 Model 400. This is a result of the the improved efficiencies of write-back cache implemented in the VAX 6000 Model 500/600.

Interleaving is used to increase the performance of the memory subsystem by distributing the memory traffic across multiple memory modules. Higher performance systems require larger minimum interleaving to maintain acceptable system performance.

- One memory module provides a one-way interleave.
- Two memory modules of like size provide a two-way interleave.
- Three memory modules of like size provide a one-way interleave.
- Four memory modules of like size provide a four-way interleave.
- Five memory modules of like size provide a one-way interleave.
- Six memory modules of like size provide a two-way interleave.
- Seven memory modules of like size provide a one-way interleave.
- Eight memory modules of like size provide a eight-way interleave.

The system will automatically configure the optimum memory interleave for a given memory configuration. For example, if seven 64-Mbyte memory modules are configured, the system will use the first four 64-Mbyte modules to establish a four-way interleave set, the next two 64-Mbyte memory modules to establish a two-way interleave set, and the last 64-Mbyte memory module to establish a one-way interleave set. Under certain applications, traffic may all be directed to the one-way interleave set; therefore, the seven module memory system is effectively a one-way interleave set.

Systems with memories of different sizes will automatically configure the optimum memory interleave by grouping smaller sized memories and then interleaving these groups with the remaining larger memories. For example, if two 32-Mbyte memories and one 64-Mbyte memory are present, the system will group the two 32-Mbyte memories and establish a two-way interleave set with the 64-Mbyte memory module. Thus, a two-way interleave is established. Other common examples of mixed memory configurations are shown below.

Starting Memory Modules	Added Memory Modules	New Memory Capacity	Minimum Interleave
One 32-Mbyte	One 64-Mbyte	96 Mbytes	One
One 32-Mbyte	One 128-Mbyte	160 Mbytes	One
Two 32-Mbyte	One 64-Mbyte	128 Mbytes	Two
Two 32-Mbyte	One 128-Mbyte	192 Mbytes	One
Three 32-Mbyte	One 64-Mbyte	160 Mbytes	One
Three 32-Mbyte	One 128-Mbyte	224 Mbytes	One
Four 32-Mbyte	One 64-Mbyte	192 Mbytes	Two
Four 32-Mbyte	One 128-Mbyte	256 Mbytes	Two

CPU ROM Kits

- Customers purchasing MS65A memory for VAX 6000 Models 200, 300 or 400 systems that have only MS62A-AB memory installed (no MS65A memory currently installed) must order CPU ROM kits according to the table below. Additional CPU ROM kits are NOT required with subsequent memory purchases for the same system.
- Systems that are shipped to customers with MS65A memory included DO NOT require CPU ROM kits.
- The CPU ROM kit includes two ROMs for installation on each CPU module. The CPU ROM purchase requirements follow.

System	ROM Kit	System	ROM Kit
VAX 6000-210	**62X00-AA**	VAX 6000-410	**64X00-AA**
VAX 6000-220	**62X00-AB**	VAX 6000-420	**64X00-AB**
VAX 6000-230	**62X00-AC**	VAX 6000-430	**64X00-AC**
VAX 6000-240	**62X00-AD**	VAX 6000-440	**64X00-AD**
		VAX 6000-450	**64X00-AE**
VAX 6000-310	**63X00-AA**	VAX 6000-460	**64X00-AF**
VAX 6000-320	**63X00-AB**		
VAX 6000-330	**63X00-AC**	**Servers**	
VAX 6000-340	**63X00-AD**	VAX 6000-310	**63X00-BA**
VAX 6000-350	**63X00-AE**	VAX 6000-320	**63X00-BB**
VAX 6000-360	**63X00-AF**		
		VAX 6000-410	**64X00-BA**
		VAX 6000-420	**64X00-BB**

VAX 4000 Models 400, 500, and 600 Memory

MS690-BA 32-Mbyte ECC memory module
MS690-CA 64-Mbyte ECC memory module
MS690-DA 128-Mbyte ECC memory module

Configuring Information

Option	Current 5 V	12 V	Power (Watts)	ac Loads	dc Loads
MS690-BA	5.3	0.0	26.5	0.0	0.0
MS690-CA	4.2	0.0	21.0	0.0	0.0
MS690-DA	6.4	0.0	32.0	0.0	0.0

VAX 4000 Model 300 Memory

MS670-BA 32-Mbyte ECC (1-Mbit chip) memory module.
MS670-CA 64-Mbyte ECC (4-Mbit chip) memory module.

Configuring Information

Option	Current 5 V	12 V	Power (Watts)	ac Loads	dc Loads
MS670-BA	3.25	0.0	16.25	0.0	0.0
MS670-CA	4.75	0.0	23.75	0.0	0.0

VAX 4000 Model 200 Memory

Systems can be expanded to 64 Mbytes of memory. System recognizes up to four memory banks; 8-Mbyte and 16-Mbyte options require one Q-bus slot and are recognized as one bank each; 32-Mbyte options require one Q-bus slot and are recognized as two memory banks (e.g., systems configured with one 8-Mbyte, one 16-Mbyte, and one 32-Mbyte—56 Mbytes of memory—require three Q-bus slots and are recognized as four memory banks.)

MS650-BB/BH 8-Mbyte ECC memory, factory/field installed.
MS650-BA/BF 16-Mbyte ECC memory, factory/field installed.
MS650-BC/BJ 32 Mbytes of memory, factory/field installed.

Configuring Information

Option	Current 5 V	12 V	Power (Watts)	ac Loads	dc Loads
MS650-BB/BH	3.10	0.0	15.50	0.0	0.0
MS650-BA/BF	3.50	0.0	17.50	0.0	0.0
MS650-BC/BJ	2.80	0.0	14.0	0.0	0.0

MicroVAX 3100 Model 10e VAXstation 3100 Models 30, 38, 40, and 48 Memory

MS42-AB	4-Mbyte parity (1-Mbit chip) memory module. Factory or field installed. Not configurable with MS42-BA or MS42-AB.
MS42-BA	12-Mbyte parity (1-Mbit chip) memory module. Factory or field installed. Not configurable with MS42-AB or MS42-BA.
MS42-CA	16-Mbyte parity (1-Mbit chip) memory module. Module has two connectors to enable either the MS42-AB or MS42-BA to be used together to increase memory. Provides system expandability to architectural limit of 32 Mbytes (including 4 Mbytes on CPU module). Not configurable with MS42-KA or MS42-CA. Factory or field installed.
MS42-KA	8-Mbyte parity (1-Mbit chip) memory module. Module has two connectors to enable either the MS42-AB or MS42-BA to be used together to increase memory. Provides system expandability up to 24 Mbytes (including 4 Mbytes on CPU module). Not configurable with MS42-CA or MS42-KA. Factory or field installed.

Configuring Information

Module	Current 5 V	12 V	Power (Watts)	ac Loads	dc Loads	I/O Inserts
MS42-AB	2.5	0	12.4	0	0	0
MS42-BA	2.8	0	13.8	0	0	0
MS42-CA	2.9	0	14.5	0	0	0
MS42-KA	2.6	0	13.0	0	0	0

VAXstation 3100 Model 76 Memory

MS44-AA	4-Mbyte parity (1-Mbit DRAM) memory module.

VAXft Memory

MS520-BB	Mirrored memory option, two 32-Mbyte modules using 1-Mbit DRAM, one for each zone; factory or field installed.
MS520-CB	Mirrored memory option of two 64-Mbyte modules using 1-Mbit DRAM, one for each zone. Not supported on Models 110 and 310. Factory or field installed.

MicroVAX 3100 Models 30/40/80 Memory

MS44L-BA	8-Mbyte parity (1-Mbit DRAM) memory option consists of two 4-Mbyte modules; factory or field installed.

DECsystem 5100/ VAXstation 4000 Model 60/ MicroVAX 3100 Model 80 Memory

MS44L-BA	8-Mbyte parity (1-Mbit DRAM) memory option consists of two 4-Mbyte modules; factory or field installed.
MS44-DA	32-Mbyte parity (4-Mbit DRAM) memory option consists of two 16-Mbyte modules; factory or field installed.

MicroVAX 3100 Model 90/ VAX 4000 Model 100 Memory

MS44L-BC	16 Mbytes of memory, 4×4-Mbyte DSIM modules
MS44-DC	64 Mbytes of memory, 4×16-Mbyte DSIM modules

VAXstation 4000 VLC Memory

MS40-BA	8-Mbyte parity (1-Mbit DRAM memory option consists of two 4-Mbyte modules; factory or field installed.

DECsystem 5500 Memory

MS220-AA/AF 32-Mbyte ECC (1-Mbit DRAM) memory; factory or field installed.

MS220-BA/BF 64-Mbyte ECC (4-Mbit DRAM) memory; factory or field installed.

Configuring Information

Module	Current 5 V	12 V	Power (Watts)	ac Loads	dc Loads
MS220-AA/AF	6.98	0.0	34.9	0.0	0.0
MS220-BA/BF	4.16	0.0	20.8	0.0	0.0

DECstation 5000 Model 200/240 DECsystem 5000 Model 200/240 Memory

MS02-AA 8-Mbyte ECC memory (1-Mbit DRAM); 15 slots allow for 120 Mbytes; not compatible with MS02-CA.

MS02-CA 32-Mbyte ECC memory (4-Mbit DRAM); 15 slots allow for 480 Mbytes; not compatible with MS02-AA.

DECsystem 5900 Memory

MS02-CA 32-Mbyte ECC memory (4-Mbit DRAM); 15 slots allow for 480 Mbytes; not compatible with MS02-AA.

DECstation 2100/3100 and DECsystem 3100 Memory

MS01-AA 4-Mbyte parity (1-Mbit DRAM) memory option consisting of two 2-Mbyte single in-line memory modules (SIMMs). System memory capacity is 24 Mbytes.

DECstation 5000 Model 120/125 DECstation 5000 Model 20/25 DECsystem 5000 Model 25 Memory

MS01-AA 4-Mbyte parity (1-Mbit DRAM) memory consisting of two 2-Mbyte single in-line memory modules (SIMMs). Not compatible with MS01-CA.

MS01-CA 16-Mbyte parity (1-Mbit DRAM) memory consisting of two 8-Mbyte single in-line memory modules (SIMMs) using 8-Mbit DRAM. Not compatible with MS01-AA.

VAXstation 4000 System Upgrades

Upgrade kits must be installed by Digital Services.

From	To	Order Number	Notes
VAXstation 3100 series with VR160, VR150, VR297, VR299, VR262, 60 Hz	VAXstation 4000 VLC 1024 × 864 (60 Hz)	**PV31U-A9**	1
VAXstation 3100 series with VRT16, VRT19, VR329, VR319, 66 Hz	VAXstation 4000 VLC 1280 × 1024 (66 Hz)	**PV31U-D9**	1
VAXstation 3100 series with VRM17, VR319, VRT16, VR320, VRT19, 72 Hz	VAXstation 4000 VLC 1280 × 1024 (72 Hz)	**PV31U-C9**	1
VAXstation 3100 series with VR297, VR299 monitors	VAXstation 4000 Model 60 2D LCG graphics	**PV61U-B9**	2
VAXstation 3100 series with VRT16, VRT19, VR320 monitors	VAXstation 4000 Model 60 2D LCG graphics	**PV61U-A9**	2
VAXstation 4000 Model 60 Base board 2D LCG graphics	VAXstation 4000 Model 90 LCSPX 2D graphics	**PV71U-AF**	3, 4
VAXstation 4000 Model 60 3D SPXg graphics	VAXstation 4000 Model 90 3D SPXg graphics	**PV71U-AH**	3, 4
VAXstation 4000 Model 60 3D SPXgt graphics	VAXstation 4000 Model 90 3D SPXgt graphics	**PV71U-AJ**	3, 4

Notes

1. Upgrade kits include: VAXstation 4000 VLC enclosure and power supply, 8 Mbytes of memory, 8-plane color/grayscale graphics board, 2D graphics accelerator, 2.7-meter (9-foot) color/monochrome video cable, bracket for one internal RZ23L or RZ24L disk, thick wire Ethernet, one DEC-423 serial line, one EIA-232D serial line with modem control, synchronous SCSI controller, software licenses and English language user documentation. Upgrade supports VAXstation 3100 options, LK201 keyboard, mouse, and three expansion boxes.

2. Upgrade kits include: VAXstation 4000 Model 60 CPU, BA46 system enclosure, power supply, 8 Mbytes of memory, 2D LCG 8-plane color graphics board, 2.7-meter (9-foot) color/monochrome video cable, brackets for three internal devices (one removable media, two fixed disks), ThinWire/thick wire Ethernet, one DEC-423 serial line, one EIA-232D serial line with modem control, synchronous SCSI controller, software licenses and English language user documentation. Upgrade supports VAXstation 3100 options, LK201 keyboard, VSxxx-AA mouse, and three expansion boxes. Upgrades require the mandatory return of VAXstation 3100 CPU board and system enclosure.

2. Upgrade kits include: VAXstation 4000 Model 90 CPU, 2D LCSPX 8-plane color graphics board, software license, VMS 5.5-2 software kit, user documentation and Model 90 medallion. Upgrades require the mandatory return of Model 60 CPU board. Trade-in values for 2D graphics card are offered through *DECdirect* catalog.

3. Upgrade kits include: VAXstation 4000 Model 90 CPU, software license, VMS 5.5-2 software kit, Model 90 user documentation and medallion. SPXg or SPXgt graphics card will be installed in Model 90 system box.

4. Model 90 systems require a minimum of 16 Mbytes of main memory; 8-Mbyte memory embedded on Model 60 system board cannot be transferred. See Step 4 for Model 90 memory configurations. Trade-in values for memory modules are offered through *DECdirect* catalog. 4-Mbyte and 16-Mbyte SIMMs from Model 60 may be transferred to Model 90 in sets of four **only**, (e.g. two MS44L-BA = 4 × 4-Mbyte SIMMs). Model 90 memory modules must be installed in sets of four matching value SIMMs.

MicroVAX 3100 Upgrades and Conversion Kits

All software must be upgraded to the latest revision when upgrading from server to timeshare systems. The following upgrades replace the CPU in the existing system enclosure.

From	To	Order Number	Includes new CPU and:
VAXserver 3100 Model 10 or 20	VAXserver 3100 Model 10e or 20e	**310XR-EA**	VMS File and Application Server license, and DECnet end-node license.
MicroVAX 3100 Model 10 or 20	MicroVAX 3100 Model 10e or 20e	**310XR-EB**	VMS 1- to 5-user license, and DECnet end-node license.
VAXserver 3100e	MicroVAX 3100e	**310XR-AD**	VMS 1- to 5-user license, and DECnet end-node license.

Note: MicroVAX 3100 Model 90 systems require 16 Mbytes of main memory. 8-Mbyte memory embedded on Model 40 and Model 80 CPU cannot be transferred; 4-Mbyte and 16-Mbyte DSIMs from Model 40 and Model 80 can be transferred to Model 90 in sets of four ONLY (e.g., two MS44L-BA = 4 × 4-Mbyte DSIMs—Model 90 memory modules must be installed in sets of four matching DSIM values).

MicroVAX 3100 Model 40	MicroVAX 3100 Model 90	**47GEX-C9**	16 Mbytes of memory, two OpenVMS user licenses, and DECnet end-node license.
MicroVAX 3100 Model 40	MicroVAX 3100 Model 90	**47GEX-E9**	64 Mbytes of memory, two OpenVMS user licenses, and DECnet end-node license.
MicroVAX 3100 Model 80	MicroVAX 3100 Model 90	**47HEX-C9**	16 Mbytes of memory, two OpenVMS user licenses, and DECnet end-node license.
MicroVAX 3100 Model 80	MicroVAX 3100 Model 90	**47HEX-E9**	64 Mbytes of memory, two OpenVMS user licenses, and DECnet end-node license.
MicroVAX 3100 Model 40	MicroVAX 3100 Model 80	**47XR-AA**	VMS 1- to 2-user license, and DECnet end-node license.

VAX 4000 Upgrades and Conversion Kits

All software must be upgraded to the proper rating when upgrading from server to timeshare systems. The following upgrades replace the CPU in the existing system enclosure.

From	To	Order Number	Includes new CPU and:
VAXserver 4000 Model 300	VAX 4000 Model 300	**670XR-AA**	VMS 1- to 40-user license, VAXcluster license, and DECnet end-node license.
MicroVAX 3500/3600 3800/3900	VAX 4000 Model 200	**660XR-AC**	H3602 I/O panel, VMS unlimited-user license, and DECnet end-node license. Requires MS650-Bx memory.
MicroVAX 3300/3400	VAX 4000 Model 200	**660XR-CC**	VMS unlimited-user license, and DECnet end-node license. Requires MS650-Bx memory.
MicroVAX 3500/3600, 3800/3900	VAX 4000 Model 200	**660XR-AA**	H3602 I/O panel, VMS 1- to 40-user license, and DECnet end-node license. Requires MS650-Bx memory.
VAXserver 3500/3600, 3800/3900	VAXserver 4000 Model 200	**660XR-BA**	H3602 I/O panel, VMS File and Application Server license, DECnet full-function license, VAXcluster license, and VMS/ULTRIX Connection license. Requires MS650-Bx memory.

CPU Upgrades

From	To	Order Number	Includes new CPU and:
MicroVAX 3300/3400	VAX 4000 Model 200	**660XR-CA**	VMS 1- to 20-user license, and DECnet end-node license. Requires MS650-Bx memory.
VAXserver 3300/3400	VAXserver 4000 Model 200	**660XR-DA**	VMS File and Application Server license, DECnet full-function license, VAXcluster license, and VMS/ULTRIX Connection license. Requires MS650-Bx memory.
VAXserver 4000 Model 200	VAX 4000 Model 200	**660XR-EA**	VMS 1- to 20-user license, DECnet end-node license, and VAXcluster Software license.
VAX 4000 Model 400	VAX 4000 Model 500	**680XR-HJ**	Upgrade license for OpenVMS Base.
VAX 4000 Model 400	VAX 4000 Model 600	**690XR-HJ**	Upgrade license for OpenVMS Base.
VAX 4000 Model 500 Multiuser	VAX 4000 Model 600	**690XR-JE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node. Replaces 690XR-DE.
VAX 4000 Model 500 Server	VAX 4000 Model 600	**690XR-JF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function. Replaces 690XR-DF.
VAX 4000 Model 500 OpenVMS Base	VAX 4000 Model 600	**690XR-JJ**	Upgrade license for OpenVMS Base.

Note: VAX 4000 Models 400, 500, and 600 require MS690 memory.

MS690-UC	64 Mbytes of memory (MS690). Requires return of 32 Mbytes of memory (MS670-BA).
MS690-UD	128 Mbytes of memory (MS690). Requires return of 64 Mbytes of memory (one MS670-CA or two MS670-BA).

Note: The following upgrade kits are for VAX/VAXserver 4000 Model 300 systems with serial numbers WF00000000 through WF04899999 and AY00000000 through AY04700100.

From	To	Order Number	Includes new CPU and:
VAX 4000 Model 300 Multiuser	VAX 4000 Model 400	**675XR-EE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node; new backplane.
VAX 4000 Model 300 Server	VAX 4000 Model 400	**675XR-EF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function; new backplane.
VAX 4000 Model 300 Multiuser	VAX 4000 Model 500	**680XR-EE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node; new backplane. Requires MS690 memory.
VAX 4000 Model 300 Server	VAX 4000 Model 500	**680XR-EF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function; new backplane. Replaces 680XR-AF.
VAX 4000 Model 300 Multiuser	VAX 4000 Model 600	**690XR-EE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node; new backplane. Replaces 690XR-AE.
VAX 4000 Model 300 Server	VAX 4000 Model 600	**690XR-EF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function; new backplane. Replaces 690XR-AF.

Note: The following upgrade kits are for VAX/VAXserver 4000 Model 300 systems with serial numbers WF04900000 and higher, AY04700101 and higher, and serial numbers that begin KA or NI.

From	To	Order Number	Includes new CPU and:
VAX 4000 Model 300 Multiuser	VAX 4000 Model 400	**675XR-FE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node.
VAX 4000 Model 300 Server	VAX 4000 Model 400	**675XR-FF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function.
VAX 4000 Model 300 Multiuser	VAX 4000 Model 500	**680XR-FE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node. Replaces 680XR-BE.
VAX 4000 Model 300 Server	VAX 4000 Model 500	**680XR-FF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function. Replaces 680XR-BF.
VAX 4000 Model 300 Multiuser	VAX 4000 Model 600	**690XR-FE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node. Replaces 690XR-BE.
VAX 4000 Model 300 Server	VAX 4000 Model 600	**690XR-FF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function. Replaces 690XR-BF.

VAX 4000 Upgrades and Conversion Kits

Note: The following upgrade kits are for VAX/VAXserver 4000 Model 300 systems with serial numbers WF00000000 through WF04899999 and AY00000000 through AY04700100.

VAX 4000 Model 300	VAX 4000 Model 400	**675XR-EE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node; new backplane. Requires MS690 memory.
VAX 4000 Model 300	VAX 4000 Model 400	**675XR-EF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function; new backplane. Requires MS690 memory.
VAX 4000 Model 300	VAX 4000 Model 500	**680XR-EE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node; new backplane. Requires MS690 memory. Replaces 680XR-AE.
VAX 4000 Model 300	VAX 4000 Model 500	**680XR-EF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function; new backplane. Requires MS690 memory. Replaces 680XR-AF.
VAX 4000 Model 300	VAX 4000 Model 600	**690XR-EE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node; new backplane. Requires MS690 memory. Replaces 690XR-AE.
VAX 4000 Model 300	VAX 4000 Model 600	**690XR-EF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function; new backplane. Requires MS690 memory. Replaces 690XR-AF.
VAX 4000 Model 300	VAX 4000 Model 500	**680XR-AE**	Upgrade licenses for VMS 1- to 40-user and DECnet end-node; new backplane. Requires MS690 memory.
VAXserver 4000 Model 300	VAXserver 4000 Model 500	**680XR-AF**	Upgrade licenses for VMS file/application server, DECnet full-function, and VAXcluster; new backplane. Requires MS690 memory.

CPU Upgrades

Note: The following upgrade kits are for VAX/VAXserver 4000 Model 300 systems with serial numbers WF04900000 and higher, AY04700101 and higher, and serial numbers that begin KA or NI.

From	To	Order Number	Includes new CPU and:
VAX 4000 Model 300	VAX 4000 Model 400	**675XR-FE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node. Requires MS690 memory.
VAX 4000 Model 300	VAX 4000 Model 400	**675XR-FF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function. Requires MS690 memory.
VAX 4000 Model 300	VAX 4000 Model 500	**680XR-FE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node. Requires MS690 memory. Replaces 680XR-BE.
VAX 4000 Model 300	VAX 4000 Model 500	**680XR-FF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function. Requires MS690 memory. Replaces 680XR-BF.
VAX 4000 Model 300	VAX 4000 Model 600	**690XR-FE**	Upgrade licenses for OpenVMS Base, Rdb runtime, 40-user, DECnet end-node. Requires MS690 memory. Replaces 690XR-BE.
VAX 4000 Model 300	VAX 4000 Model 600	**690XR-FF**	Upgrade licenses for OpenVMS Base, Rdb runtime, VAXcluster, DECnet full-function. Requires MS690 memory. Replaces 690XR-BF.

VAX 6000 CPU Upgrades

To upgrade to VAX 6000 Model 500/600 systems, follow the steps listed below. For all other upgrades, select the appropriate upgrade based on the steps that follow.

Step 1 — Select CPU upgrade.
Step 2 — Unless included with upgrade package, replace any MS62A-AB memory with MS65A-xx memory.
Step 3 — If model number of CPU cabinet serial tag is H9657-Cx, Steps 3a and 3b are not required.
Step 3a — If the following items—battery backup, more than 12 XMI slots, or more than four CPUs—are required, order number H9657-CU (power conversion kit).
Step 3b — If the H9657-CU is required and if more than two VAXBI channels are in the system, order one DWMBB-AB for each VAXBI in excess of two.
Step 3c — If battery backup is required, order H7236-A. Replace H7231-N with H7236-A.
Step 4 — If a CIBCA-AA is present, replace with CIXCD-AB or CIBCA-BA.

The following upgrade packages include CPU processor(s), VMS or ULTRIX licenses, and one full-year product warranty; DECnet full function license included unless noted differently with VMS upgrades—DECnet-ULTRIX license included with ULTRIX upgrades.

Model 200

From—To	VMS	ULTRIX
Model 210–610	**66AUA-AA**	
Model 220–610	**66AVA-AA**	
Model 220–620	**66BUA-AA**	
Model 230–630	**66CUA-AA**	
Model 240–640	**66DUA-AA**	
Model 210–610	**66AUE-AA***	
Model 220–610	**66AUF-AA***	
Model 230–610	**66AUH-AA***	
Model 240–610	**66AUJ-AA***	
Model 210–510	**65AUA-AA**	**65AUA-BA**
Model 220–520	**65BUA-AA**	**65BUA-BA**
Model 230–530	**65CUA-AA**	**65CUA-BA**
Model 240–540	**65DUA-AA**	**65DUA-BA**
Model 210–510	**65AUE-AA***	
Model 220–510	**65AUH-AA***	
Model 230–510	**65AUJ-AA***	
Model 240–510	**65AUK-AA***	
Model 210–410	**64AUA-AA**	**64AUA-BA**
Model 220–420	**64BUA-AA**	**64BUA-BA**
Model 230–430	**64CUA-AA**	**64CUA-BA**
Model 240–440	**64DUA-AA**	**64DUA-BA**

Model 300

From—To	VMS	ULTRIX
Model 310–610	**66AUA-AC**	
Model 320–610	**66AVA-AC**	
Model 320–620	**66BUA-AC**	
Model 330–630	**66CUA-AC**	
Model 340–640	**66DUA-AC**	
Model 350–650	**66EUA-AC**	
Model 360–660	**66FUA-AC**	
Model 310–610	**66AUE-AC***	
Model 320–610	**66AUF-AC***	
Model 330–610	**66AUH-AC***	
Model 340–610	**66AUJ-AC***	
Model 350–610	**66AUK-AC***	
Model 360–610	**66AUL-AC***	
Model 310–510	**65AUA-AC**	**65AUA-BC**
Model 320–520	**65BUA-AC**	**65BUA-BC**
Model 330–530	**65CUA-AC**	**65CUA-BC**
Model 340–540	**65DUA-AC**	**65DUA-BC**
Model 350–550	**65EUA-AC**	**65EUA-BC**
Model 360–560	**65FUA-AC**	**65FUA-BC**
Model 310–510	**65AUE-AC***	
Model 320–510	**65AUH-AC***	
Model 310–410	**64AUA-AC**	**64AUA-BC**
Model 320–420	**64BUA-AC**	**64BUA-BC**
Model 330–430	**64CUA-AC**	**64CUA-BC**
Model 340–440	**64DUA-AC**	**64DUA-BC**
Model 350–450	**64EUA-AC**	**64EUA-BC**
Model 360–460	**64FUA-AC**	**64FUA-BC**

*Includes 128 Mbytes (MS65A-DA) of memory.

CPU Upgrades

Model 400

From—To	VMS	ULTRIX
Model 410–610	66AUA-AF	
Model 420–610	66AVA-AF	
Model 420–620	66BUA-AF	
Model 430–630	66CUA-AF	
Model 440–640	66DUA-AF	
Model 450–650	66EUA-AF	
Model 460–660	66FUA-AF	
Model 410–610	66AUE-AF*	
Model 420–610	66AUF-AF*	
Model 430–610	66AUH-AF*	
Model 440–620	66BUJ-AF*	
Model 450–620	66BUK-AF*	
Model 460–620	66BUL-AF*	
Model 410–510	66AUE-AF*	
Model 410–510	65AUA-AF	65AUA-BF
Model 420–520	65BUA-AF	65BUA-BF
Model 430–530	65CUA-AF	65CUA-BF
Model 440–540	65DUA-AF	65DUA-BF
Model 450–550	65EUA-AF	65EUA-BF
Model 460–560	65FUA-AF	65FUA-BF
Model 410–420	64BUA-AF	64BUA-BF
Model 420–430	64CUA-AF	64CUA-BF
Model 430–440	64DUA-AF	64DUA-BF
Model 440–450	64EUA-AF	64EUA-BF
Model 450–460	64FUA-AF	64FUA-BF

Model 500

From—To	VMS	ULTRIX
Model 510–610	66AUA-AK	
Model 520–620	66BUA-AK	
Model 530–630	66CUA-AK	
Model 540–640	66DUA-AK	
Model 550–650	66EUA-AK	
Model 560–660	66FUA-AK	
Model 510–610	66AUD-AK†	
Model 520–620	66BUD-AK†	
Model 530–630	66CUD-AK†	
Model 540–640	66DUD-AK†	
Model 550–650	66EUD-AK†	
Model 560–660	66FUD-AK†	
Model 510–520	65BUA-AK	65BUA-BK
Model 520–530	65CUA-AK	65CUA-BK
Model 530–540	65DUA-AK	65DUA-BK
Model 540–550	65EUA-AK	65EUA-BK
Model 550–560	65FUA-AK	65FUA-BK
Model 510–520	65BUD-AK†	
Model 520–530	65CUD-AK†	
Model 530–540	65DUD-AK†	
Model 540–550	65EUD-AK†	
Model 550–560	65FUD-AK†	

Model 600

From—To	VMS	ULTRIX
Model 610–620	66BUA-AM	
Model 620–630	66CUA-AM	
Model 630–640	66DUA-AM	
Model 640–650	66EUA-AM	
Model 650–660	66FUA-AM	
Model 610–620	66BUD-AM†	
Model 620–630	66CUD-AM†	
Model 630–640	66DUD-AM†	
Model 640–650	66EUD-AM†	
Model 650–660	66FUD-AM†	

VAXserver 6000 Upgrades

From—To	VMS	ULTRIX
Model 310–610	66KUA-HD	
Model 320–620	66LUA-HD	
Model 310–510	65KUA-HD	65KUA-JD
Model 320–520	65LUA-HD	65LUA-JD
Model 310–410	64KUA-HD	64KUA-BD
Model 320–420	64LUA-HD	64LUA-BD
Model 410–610	66KUA-HH	
Model 420–620	66LUA-HH	
Model 410–510	65KUA-HH	65KUA-JH
Model 420–520	65LUA-HH	65LUA-JH
Model 410–420	64LUA-HH	64LUA-BD
Model 510–610	66KUA-HL	
Model 520–620	66LUA-HL	
Model 510–520	65LUA-HL	65LUA-JL
Model 610–620	66LUA-HN	
Model 620–630	66MUA-HN	
Model 630–640	66NUA-HN	

VAXserver 6000 to VAX 6000 Conversion Kits

From—To	VMS	ULTRIX
Model 410–410	64AUA-AH	64AUA-BH
Model 420–420	64BUA-AH	64BUA-BH
Model 510–510	65AUA-AL	65AUA-BL
Model 520–520	65BUA-AL	65BUA-BL
Model 610–610	66AUA-AN	
Model 620–620	66BUA-AN	
Model 630–630	66CUA-AN	

* Includes 128 Mbytes (MS65A-DA) of memory.

† Includes OpenVMS Base license (DECnet not included)

VAX 7000 CPU Upgrades

Base upgrade packages include CPU processor(s), OpenVMS base license license, and one full-year product warranty. Traditional upgrade packages include OpenVMS unlimited-use license, DECnet full-function license, and one full year product warranty.

From—To	Traditional	Base
Model 610–620	**7FBTA-BA**	**7FBTA-AA**
Model 620–630	**7FCTA-BA**	**7FCTA-AA**
Model 630–640	**7FDTA-BA**	**7FDTA-AA**

VAX 10000 Upgrades

Traditional upgrade packages include a CPU module plus license upgrades for OpenVMS base license and OpenVMS unlimited-use license, DECnet full-function license and Rdb Runtime license. One full-year product warranty included.

Upgrades packages for NAS 400 based systems, which include DECnet full-function license, include a CPU module plus license upgrades for OpenVMS base and OpenVMS unlimited-use licenses. NAS 400 and layered products must be upgraded separately.

From—To	Traditional Upgrades for Base Systems	NAS 400 Upgrades for Fully Configured 3- and 5-Cabinet Systems
Model 610–620	**9FBTA-BB**	**9FBTA-IB**
Model 620–630	**9FCTA-BB**	**9FCTA-IB**
Model 630–640	**9FDTA-BB**	**9FDTA-IB**

VAXft Upgrade

Upgrade package includes two VAXft Model 410 CPUs and documentation; no software license upgrade required.

From—To	
Model 310–410	**55UPG-XX**

DECstation 5000 Series Upgrades

Upgrade kits are installed by Digital Services.

From	To		Note
DECstation 2100	DECstation 5000 Model 120	**PM321-DY/DZ**	1
DECstation 2100	DECstation 5000 Model 125	**PM321-LY/LZ**	1
DECstation 2100	DECstation 5000 Model 133	**PM327-YY/YZ**	1
DECstation 3100	DECstation 5000 Model 125	**PM321-MY/MZ**	1
DECstation 3100	DECstation 5000 Model 133	**PM327-ZY/ZZ**	1
DECstation 5000 Model 200	DECstation 5000 Model 240	**PM38U-AY**	2
R3000 CPU Upgrades			
DECstation 5000 Models 20/120 with R3000 20-MHz daughter card	DECstation 5000 Models 25/125 with R3000 25-MHz daughter card	**KN02-CC**	3
DECstation 5000 Models 25/125 with R3000 25-MHz daughter card	DECstation 5000 Models 33/133 with R3000 33-MHz daughter card	**KN02-DC**	3

Notes

1. Upgrade kits include: DECstation 5000 Model 100 series enclosure, power supply, base system module, 20-MHz, 25-MHz, or 33 MHz CPU daughter card, HX graphics, keyboard/mouse cable, color and grayscale monitor cables, brackets for two RZ2x disk drives and one RX23 diskette drive, Thick wire-to-ThinWire Ethernet adapter DESTA-BA with thick wire cable for attaching DESTA to base system, and required upgrade licenses (ULTRIX Workstation Software license and DECnet-ULTRIX license).
2. Upgrade kits include: DECstation 5000 Model 240 enclosure, base system module, 40-MHz CPU daughter card, and required upgrade license. Requires mandatory return of Model 200 parts.
3. CPU daughter card upgrades include required upgrade licenses (ULTRIX Workstation Software license). Requires mandatory return of CPU daughter card.

DECsystem 5000 Series Upgrades

Upgrade kits must be installed by Digital Services.

From	To	Order Number	Notes
DECsystem 5000 Model 200	DECsystem 5000 Model 240	**PM38U-BY**	1

Note

1. Upgrade kits include: DECsystem 5000 Model 240 enclosure, base system module, 40-MHz CPU daughter card, and required upgrade license. Requires mandatory return of DECsystem 5000 Model 200 parts.

Easy System Upgrades

Overview

Digital's "Easy System Upgrades" take the complexity out of cabinet upgrades by offering one order number and one price to upgrade existing VAX and MicroVAX systems to the more powerful and efficient VAX 9000, VAX 6000, VAX 4000 and MicroVAX 3100 systems. An "Easy System Upgrade" (ESU) package provides hardware, software licenses, plus one year of services, for one low price. Each "Easy System Upgrade" order number delivers the following components:

- Built-in value for existing system
- System upgrade—see "System Delivered" in following chart:
  - VAX 9000 VMS System (with memory and CIXCD Cluster Adapter)
  - VAX 6000 VMS System (with memory)
  - VAX 4000 VMS System (with memory and DSSI controllers)
  - MicroVAX 3100 Preconfigured System (with disk and tape)
- VMS and DECnet paid-up licenses
- Software license upgrades for all Digital VMS layered products (except ALL-IN-1)
- One year of standard hardware warranty
- One year of Software Product Services (except ALL-IN-1)
- Installation of new hardware, deinstallation of existing hardware, reconnection of existing CPU options—where applicable
- Up to 12 months to return existing hardware

"Easy System Upgrades" provide cabinet upgrades for customers with MicroVAX 2000/II, MicroVAX 3xxx, VAX-11/7xx, and VAX 8xxx systems.

Easy System Upgrades

Current System (From)	Upgraded System (To)	OpenVMS Licensed Users	Memory	Order Number
MicroVAX 2000/3100/3100e	MicroVAX 3100 Model 40	Two	8 Mbytes	DV-31GU1-A9
	MicroVAX 3100 Model 80	Two	8 Mbytes	DV-31HU1-A9
	MicroVAX 3100 Model 90	Two	64 Mbytes	DV-31PU1-E9
MicroVAX II	VAX 4000 Model 200	10	8 Mbytes	DV-42RU1-A2
	VAX 4000 Model 200	20	16 Mbytes	DV-42HU1-A9
	VAX 4000 Model 200	Unlimited	16 Mbytes	DV-42HU1-B9
	VAX 4000 Model 400	40	32 Mbytes	DV-44JU1-A9
	VAX 4000 Model 500	40	64 Mbytes	DV-45JU2-A9
MicroVAX 3300/3500	VAX 4000 Model 400	20	32 Mbytes	DV-44JU1-M9
MicroVAX 3500/3600/3800/3900	VAX 4000 Model 400	Unlimited	32 Mbytes	DV-44JU1-E9
	VAX 4000 Model 500	Unlimited	64 Mbytes	DV-45JU2-B9
VAX 4000 Model 200	VAX 4000 Model 400	20	32 Mbytes	DV-44JU1-K9
	VAX 4000 Model 400	40	32 Mbytes	DV-44JU1-L9
VAX 11/7xx	VAX 4000 Model 200	Unlimited	16 Mbytes	DV-42HU1-C9
	VAX 4000 Model 400	Unlimited	32 Mbytes	DV-44JU1-C9
	VAX 4000 Model 500	Unlimited	64 Mbytes	DV-45JU2-D9
	VAX 6000 Model 510	Unlimited	128 Mbytes	65XMH-AE
	VAX 6000 Model 610	Unlimited	128 Mbytes	66XMB-AE
	VAX 7000 Model 610	Unlimited	128 Mbytes	7FAXA-BA
VAX 82xx	VAX 4000 Model 400	Unlimited	64 Mbytes	DV-44JU1-H9
	VAX 4000 Model 500	Unlimited	64 Mbytes	DV-45JU2-E9
	VAX 6000 Model 510	Unlimited	128 Mbytes	65XMI-AE
	VAX 6000 Model 610	Unlimited	128 Mbytes	66XMC-AE
	VAX 7000 Model 610	Unlimited	128 Mbytes	7FAXB-BA
VAX 83xx	VAX 4000 Model 400	Unlimited	64 Mbytes	DV-44JU1-J9
	VAX 4000 Model 500	Unlimited	64 Mbytes	DV-45JU2-F9
	VAX 6000 Model 510	Unlimited	128 Mbytes	65XMJ-AE
	VAX 6000 Model 610	Unlimited	128 Mbytes	66XMD-AE
	VAX 7000 Model 610	Unlimited	128 Mbytes	7FAXN-BA
VAX 8530	VAX 6000 Model 510	Unlimited	128 Mbytes	65XMK-AE
	VAX 6000 Model 610	Unlimited	128 Mbytes	66XME-AE
VAX 8530/86xx	VAX 4000 Model 600	Unlimited	128 Mbytes	DV-46JU1-A9
	VAX 7000 Model 610	Unlimited	128 Mbytes	7FAXC-BA
VAX 8550	VAX 6000 Model 510	Unlimited	128 Mbytes	65XML-AE
	VAX 6000 Model 610	Unlimited	128 Mbytes	66XMF-AE
	VAX 7000 Model 610	Unlimited	128 Mbytes	7FAXD-BA
	VAX 4000 Model 600	Unlimited	128 Mbytes	DV-46JU1-B9
VAX 8600	VAX 6000 Model 510	Unlimited	128 Mbytes	65XMM-AE
	VAX 6000 Model 610	Unlimited	128 Mbytes	66XMH-AE
VAX 8650	VAX 6000 Model 510	Unlimited	128 Mbytes	65XMN-AE
	VAX 6000 Model 610	Unlimited	128 Mbytes	66XMJ-AE
VAX 8700/8810	VAX 6000 Model 610	Unlimited	128 Mbytes	66XMK-AE
	VAX 7000 Model 610	Unlimited	128 Mbytes	7FAXE-BA
VAX 8800/8820	VAX 6000 Model 610	Unlimited	128 Mbytes	66XML-AE
	VAX 7000 Model 610	Unlimited	128 Mbytes	7FAXF-BA

Environmental Products

Introduction

Digital's environmental power products solve power-related problems in two ways: They protect individual circuits and they control the power flowing into the system. Power-related solutions control the quality of electrical power flowing into a computer. Digital's environmental power products simplify system installations and ensure efficient, reliable system operation. For product details, configuration, and ordering information, refer to *Digital's Environmental Power Products Catalog* (EB-M4442-79) or call 800-DIGITAL.

Environmental Products Summary Chart

	UPS HA4000 Personal Series PLUS[1]	Personal Series UPS	PCS+[2]	PDS+[3]	CVC[4]	TVSS[5]	REMS/EMS[6]
High energy transients, impulses and spikes	X	X	X	–	X	X	–
High/low voltage, sags, surges	X	X	X	–	X	–	–
Phase rotation	X	X	X	X	–	–	–
Improper/inadequate wiring or grounding	X	X	X	X	X	–	–
Electrical noise	X	X	X	X	X	–	–
Power outage	X	X	–	–	–	–	–
Environmental monitoring	–	–	X	X	–	–	X
Software link with REMS/EMS	X	X	X	X	–	–	N/A
System type	All Digital systems single-phase 3-phase	Single-phase small to mid-range systems	3-phase mid-range to large systems	3-phase mid-range to large systems	Small to mid-range systems	All Digital systems	All Digital VAX VMS systems

[1] UPS protects against blackouts, conditions, distributes
[2] PCS+, conditions, distributes, monitors
[3] PDS+ distributes, monitors
[4] CVC conditions, distributes
[5] TVSS suppresses
[6] REMS/EMS environmental monitoring and software

Power Conditioning System Plus/Power Distribution System Plus

Offering comprehensive protection for large systems is the Power Conditioning System Plus (PCS+). A PCS+ to accompany a VAX system provides a dependable solution to every power-related problem except a power outage; it corrects electrical variations including sags, surges, low and high voltage fluctuations, brownouts, spikes, and impulses while eliminating power distribution problems. It also provides comprehensive environmental monitoring capability. For owners of medium-to-large computer systems that do not need power conditioning or built-in surge suppression, five sizes of Power Distribution Systems (PDS+) are offered. The PDS+, like the PCS+, replaces conventional wiring and monitors electrical power.

PCS+/PDS+ Options

The *Building Interface Alarm* option (H7317-KB) enables interconnection with building systems such as smoke and water detectors, halon and air-conditioning systems, and security setups. *Environmental Monitor/Repo* stations (H7317-JA/JB/JC) are now offered for the Power Distribution and Power Conditioning Systems. They feature quick-read LCD temperature and humidity monitoring options, with an audible alarm silence and reset button, and automatic power off for high ambient temperature conditions.

Constant Voltage Conditioners

The H7225 Constant Voltage Conditioner (CVC) products are self-contained, integrated power-conditioning systems designed specificially for use with single-phase-powered Digital products. The CVC products were developed to correct input voltage fluctuations, as well as low-voltage brownout conditions often encountered during peak power usage, and to provide input power factor correction. Attenuation of the effects of electrical noise, impulses, and spikes is also provided by the CVC products. The H7225 series is available in sizes from 0.5 kVA to 3.0 kVA, single phase.

Transient Voltage Surge Suppressors

The 4N-GAXXX-xx family of Transient Voltage Surge Suppressor (TVSS) products are specifically designed to prevent high-energy impulses that can damage a computer system. These energy transients can enter the system through the ac power lines or through the data communications lines. The line of data and power TVSS products is now offered in over 150 models, and includes power/data combinations and rackmount models.

Remote Environmental Monitoring Software (REMS) Environmental Monitoring System (EMS)

The Environmental Monitoring System (EMS) is an advanced, microprocessor-based monitoring system built to handle the total electronic environmental surveillance of any computer site and its supporting equipment by providing timely warnings against environmental threats such as fire, water, extreme temperatures, and humidity. It monitors from one to 112 external sensors/probes, connected to the remote sensing unit, to provide realtime sampling of physical environmental changes up to 1524 meters (5000 feet) away, and compares these changes to user-established thresholds. As a standalone unit, EMS responds immediately with both a visual display and an audio announcement on its connecting VT100-compatible terminal.

The EMS can also be daisychained with up to seven additional EMS units, or H7317 Power Distribution Systems Plus (PDS+), or H7318 Power Conditioning Systems Plus (PCS+) to form a monitoring network. When alarms occur in a configuration of more than one unit, the alarm is displayed simultaneously on the unit detecting the alarm condition as well as on the master unit. An optional layered VMS software package, VAX Remote Environmental Monitoring Software (REMS), features centralized monitoring from a designated terminal. This software allows the system to send mail messages and build historical environmental data files that can reveal environmental patterns leading to equipment failures. REMS requires VAX FMS software.

HA4000 3-Phase Uninterruptible Power System

Product Description

The HA4000 3-Phase Uninterruptible Power System (UPS), provides reliable protection against a power blackout. In the event of an outage, the HA4000 system provides the computer system battery backup power ranging from 5 to 30 minutes on the battery option selected. This allows time to ride through the outage, power down in an orderly fashion, or switch to an alternative power source automatically without any interruption to computer operations.

The HA4000 also protects the computer system and valuable data against everyday power aberrations—voltage surges, voltage spikes, high energy transients, electrical noise, and low voltage conditions. With REMS software, the HA4000 notifies the VAX systems of a power/environmental problem or occurrence and may trigger an automatic, controlled shutdown.

This system is designed and tested specifically to support nonlinear power loads with no derating. The static bypass feature automatically transfers the load to utility during a UPS system fault or overload condition. The latest microprocessor-controlled operations and diagnostics are featured to maximize system uptime. The HA4000 provides state-of-the-art Pulse Width Modulation (PWM) inverter technology for optimum system performance.

It has a small footprint and quiet operation for an easy fit into the computer room environment.

The HA4000 features high efficiency ratings at both full- and halfload. Easy, menu-driven operating instructions and monitoring procedures display messages in five languages. A maintenance bypass feature allows full computer system operation during routine UPS maintenance. The HA4000 offers user-friendly online diagnostics and a modular design for easy and efficient maintenance and service.

Seven different sizes are available for 11-kVA, 20-kVA, 40-kVA, 60-kVA, 80-kVA, 100-kVA, and 125-kVA power requirements. The HA4000 features a self-contained battery cabinet with sealed, maintenance-free batteries.

The HA4000 11-kVA unit houses the UPS and the batteries in a single cabinet. The standard configuration of the 20–80-kVA models consists of a main UPS cabinet and a matching battery cabinet. For 100- and 125-kVA models, the standard configuration comprises a main UPS cabinet, an auxiliary cabinet which contains the maintenance bypass and an input THD filter, and a matching battery cabinet.

Since the 100-kVA and 125-kVA cabinets are designed for 480-Vac input and output, an additional cabinet may be necessary to step up or step down the voltage for other voltage requirements. The 11-, 100-, and 125-kVA UPS cabinets and the Power Distribution Unit are mounted on permanent casters. The 20–80-kVA systems are shipped with removable casters.

The HA4000 is manufactured by EPE Technologies, Inc.

Product Description
(Continued)

- **Auxiliary Cabinet**

  For 20–80-kVA systems: The auxiliary cabinet houses one or both of the following two options:

  – Input Isolation Transformer
  – Input Total Harmonic Distortion (THD) Reduction Filter

  For 100- and 125-kVA systems: The auxiliary cabinet houses the maintenance bypass and the input THD reduction filter; 480/208 applications are available **only** with distribution for 480/208-V applications. The bypass, filter, transformer, and distribution panel board are housed in the distribution cabinet. For 208/208-Vac applications, a second auxiliary cabinet with an additional transformer would be required to step down the input voltage.

- **Distribution Cabinet**

  For 20–80-kVA systems: The distribution cabinet provides an efficient method of power distribution throughout the computer room. This cabinet is bolted to the UPS system and offers isolation and an optional output transformer. The output transformer provides another layer of isolation while in bypass mode and is required for distribution cabinets attached to 480/480-Vac UPS systems.

  For 100- and 125-kVA systems: The auxiliary cabinet houses the maintenance bypass and the input THD reduction filter and, in some cases, an autotransformer. For 208/208-Vac applications, two auxiliary cabinets (each containing an autotransformer) are required; 480/208-V applications require the distribution cabinet (which contains an isolation transformer).

- **Power Distribution Unit (PDU)**

  The power distribution unit has the same capabilities as the distribution cabinet described above. However, it is intended for remote placement and is not bolted to the HA4000 system. The PDU may be utilized as a standalone distribution option with or without a UPS system.

HA4000 System Specifications

System Input Characteristics

Input Voltage*	3 phase Delta 208 V or 480 V (+10%/–15%)
Input Frequency	60 Hz ± 5%
Input Current THD	Less than 10% (with optional input THD reduction filter) 20–125 kVA

* In Canada, CSA cabinets are required in addition to standard system configuration for 20–80 kVA units only. CSA cabinets are available with 600/208 V input/output transformer or with CSA option only. Call 800-DIGITAL or 603-884-6660 and ask to speak with an Environmental Products Support Specialist.

Battery Characteristics

D.C. Voltage Bus

11 kVA: 232-V float, 163-V cutoff
20–80 kVA: 436-V float, 325-V cutoff
100 and 125 kVA: 540-V float, 390-V cutoff

Battery Time

Nominal 5–30 minutes at full load (see chart)

HA4000 Battery Times (in minutes) at Full Load*

kVA	Minimum	Standard	Extended	Extra Extended
11	N/A	12	N/A	N/A
20	5	21	30	N/A
40	5	14	30	N/A
60	5	11	30	N/A
80	5	14	22	N/A
100	6	13	26	40
125	5	10	18	27

Battery type: sealed lead acid maintenance free.
* All battery times are approximate and based on 0.8 power factor (pf). Battery times may vary depending on age, temperature, load, and use.

System Output Characteristics

Output Power Ratings	11, 20, 40, 60, 80, 100, and 125 kVA
Output Voltage	208/120 or 480/277 3-phase, 4-wire Y, plus ground* (adjustable ±5% via software)
Output Frequency	60 Hz ± 0.25, 0.5, 0.75, 1 (software selectable) 60 Hz ± 1% free running
Output Voltage THD	Less than 4%, 100% nonlinear or linear load with current crest factor up to 3.0
Output Power Factor Capability	0.65 lagging (nonlinear) to 0.8 leading (linear)
Output Voltage Deviation (maximum)	± 3% for 50% load step, ± 5% for 100% load step
Output Overload Capability	150% of rated load for 1 minute, 125% of rated load for 10 minutes

* 11 kVA available with 208-V input/output only, 4-wire Y plus ground.

Environmental Specifications

Overall Efficiency	Up to 91%; 85% at half load (11–80 kVA) 93% full load at 0.8 power factor (pf); 92.5% at half load (100 and 125 kVA)
Ambient Temperature	0°–40° C (32°–104° F)
Operating Humidity	0%–95% noncondensing
Operating Altitude	2438 m (8000 ft)
Acoustic Noise	less than 60 dB

HA4000 Order Number Selection

To establish kVA and cable requirements, develop a worksheet with the following column titles: (1) Equipment, (2) kVA, (3) Poles, (4) Receptacles, and (5) Cable Order Number.

In **column 1** list the computer equipment and peripherals.

In **column 2** list the kVA rating for each item. kVA = (Volts × Amps) divided by 1000, or kVA approximately equals KW × 1.25. Contact Service Delivery Environmentalist for further assistance.

In **column 3** list the number of poles for each listed item. Note whether the circuit is one pole, two pole, or three pole.

In **column 4** list the NEMA receptacle number for each listed item.

In **column 5** list cable order numbers. For specific cable information and cable order numbers, refer to the Cable section of *Digital's Environmental Power Products Catalog* (EB-M4442-79).

Now add up column 2 to obtain the total kVA and add up column 3 to obtain total poles.

To determine the HA4000 system order numbers, list the available input voltage for the UPS system. The building electrician can provide this information.

Configuration Guidelines for 11–80 kVA HA4000 Systems

Determine the desired output voltage of the UPS system.

From the HA4000 order number chart, select the HA4000 UPS cabinet model number by using the total kVA requirement and the available input voltage along with the desired output voltage.

Note: Although the HA4000 unit can be run at 100 percent of its rated capacity, 75 percent loading is recommended, to allow for future growth.

Select the battery cabinet, auxiliary cabinet, and distribution cabinet by reading across from the UPS cabinet model number.

Refer to the *Cable Assemblies Reference Guide* or see site preparation for each product in this catalog for information.

11–80 kVA HA4000 Order Number Chart

		Base System	Options					
				Auxiliary Cabinet			Distribution Cabinet	
kVA	UPS Voltage (60 Hz)	UPS Cabinet	Battery Cabinet	w/F&T[1]	w/T	w/F	w/T	w/oT
11	208/208	HA42A-AA[2]	N/A	N/A	N/A	N/A	N/A	N/A
	208/208	HA432-AB[3]	N/A	N/A	N/A	N/A	N/A	N/A
							42 Pole	
20	208/208	HA42A-AH	HA42B-CH	HA42C-AH	HA42D-AH	HA42E-PH	HA42J-AH	HA42J-AT
	480/208	HA42A-BH	HA42B-CH	HA42C-BH	HA42D-BH	HA42E-PH	HA42J-AH	HA42J-AT
	480/480	HA42A-CH	HA42B-CH	HA42C-CH	HA42D-CH	HA42E-PH	HA42J-BH	N/A
40	208/208	HA42A-AK	HA42B-CK	HA42C-AK	HA42D-AK	HA42E-PK	HA42J-AK	HA42J-AT
	480/208	HA42A-BK	HA42B-CK	HA42C-BK	HA42D-BK	HA42E-PK	HA42J-AK	HA42J-AT
	480/480	HA42A-CK	HA42B-CK	HA42C-CK	HA42D-CK	HA42E-PK	HA42J-BK	N/A
							84 Pole	
60	208/208	HA42A-AM	HA44B-CM	HA42C-AM	HA42D-AM	HA42E-PM	HA42K-AM	HA42K-AT
	480/208	HA42A-BM	HA42B-CM	HA42C-BM	HA42D-BM	HA42E-PM	HA42K-AM	HA42K-AT
	480/480	HA42A-CM	HA42B-CM	HA42C-CM	HA42D-CM	HA42E-PM	HA42K-BM	N/A
80	208/208	HA42A-AN	HA44B-CN[4]	HA42C-AN	HA42D-AN	HA42E-PN	HA42K-AN	HA42K-AT
	480/208	HA42A-BN	HA42B-CN[4]	HA42C-BN	HA42D-BN	HA42E-PN	HA42K-AN	HA42K-AT
	480/480	HA42A-CN	HA42B-CN[4]	HA42C-CN	HA42D-CN	HA42E-PN	HA42K-BN	N/A

[1] F = Filter; T = Transformer
[2] With 10-minute battery included
[3] With 10-minute battery, EIA-232 communications port, 30 pole
[4] For site planning purposes, plan for two cabinet footprint.

Configuration Guidelines for 100 and 125 kVA HA4000 Systems

Base level configuration consists of three cabinets: UPS, battery, and auxiliary (or distribution depending on the voltage application). Begin by selecting the UPS and battery cabinet.

kVA	UPS	Battery*	
100	HA44A-CP	HA44B-CT	(standard duration)
		HA44B-AT	(short duration)
		HA44B-ET	(extended duration)
		HA44B-FT	(extra extended duration)
125	HA44A-CR	HA44B-CT	(standard duration)
		HA44B-AT	(short duration)
		HA44B-ET	(extended duration)
		HA44B-FT	(extra extended duration)

* See battery chart for exact battery times at rated kVA.

Next, select the appropriate input/output voltage application to determine the correct auxiliary and/or distribution cabinet. Offered as an option, 84-pole distribution is available in either bolt-on or free-standing (PDU) cabinets. The free-standing PDU can also function as a standalone distribution cabinet. All distribution cabinets contain 480/208 input/output voltage transformers. Only the UPS cabinet and PDU are voltage-dependent; the battery, auxiliary, and bolt-on distribution cabinets are the same for both the 100 and 125 kVA units.

Application Input/Output Voltage	Auxiliary Cabinet	Distribution (84 Poles)	
		Bolt-on or	PDU
480/480	HA44L-PR	N/A	N/A
480/208 with distribution	N/A	HA44M-BR or	4N-CMCCB-BE* (100 kVA) 4N-CMCCB-BF* (125 kVA)
208/208 with distribution	HA44L-GR	HA44M-BR or	4N-CMCCB-BE*† (100 kVA) 4N-CMCCB-BF*† (125 kVA)
208/208	HA44L-GR and HA44L-NR	N/A	N/A

* Requires HA44L-PR auxiliary cabinet.
† Requires HA44L-NR auxiliary cabinet in place of HA44L-GR.

For applications requiring 600-V input, add an HA44L-HR auxiliary cabinet (contains a 600-V/480-V transformer) to the above configurations.

Options For All HA4000 Systems

HA420-A3	Remote alarm panel (11–125 kVA)
HA420-AA	Remote status panel with 150-foot cable (11–125 kVA)
HA420-AB	Remote status panel with 300-foot cable (11–125 kVA)
QL-VI5A9-AA	Remote Environmental Monitoring Software (REMS) right-to-use license and warranty
QA-VI5AA-Hx	REMS media and documentation kit
QT-VI5A9-**	REMS support services
HA420-B1	Smoke detection system (11–125 kVA)
HA420-C2	Ground fault detection system (20–125 kVA only)

x Denotes media type: 5 = TK50, M = magtape

HA4000 Cabinets Weight Chart (all weights in pounds)

Cabinet	Models						
	11 kVA*	**20 kVA**	**40 kVA**	**60 kVA**	**80 kVA**	**100 kVA***	**125 kVA***
UPS Cabinet							
Base System	1100 (B)	1075 (B)	1385 (B)	1725 (A)	2250 (A)	2250 (A)	2250 (A)
Battery Cabinets							
Short duration	N/A	1169 (B)	1169 (B)	1820 (A)	1820 (A)	3100 (D)	3100 (D)
Standard duration	N/A	1820 (B)	1995 (A)	1995 (A)	2 @ 1820 (A)	3300 (D)	3300 (D)
Extended duration	N/A	1820 (A)	2 @ 1820 (A)	2 @ 1995 (A)	2 @ 1995 (A)	2 @ 3100 (D)	2 @ 3300 (D)
Extra extended duration	N/A	N/A	N/A	N/A	N/A	2 @ 3300 (D)	2 @ 3300 (D)
Auxiliary Cabinets for 20–80 kVA Systems							
With filter and transformer (480/208)	N/A	591 (C)	724 (C)	993 (C)	1225 (C)	N/A	N/A
With transformer only (480/208)	N/A	450 (C)	550 (C)	720 (C)	850 (C)	N/A	N/A
With filter only	N/A	341 (C)	374 (C)	473 (C)	573 (C)	N/A	N/A
Auxiliary Cabinets for 100 and 125 kVA Systems							
With filter and maintenance bypass (480/208)	N/A	N/A	N/A	N/A	N/A	400 (C)	400 (C)
With transformer only (480/208)	N/A	N/A	N/A	N/A	N/A	700 (C)	700 (C)
With filter, transformer, and maintenance bypass (480/208)	N/A	N/A	N/A	N/A	N/A	1100 (C)	1100 (C)
With transformer only (600/480)	N/A	N/A	N/A	N/A	N/A	700 (C)	700 (C)
Distribution Cabinets							
With transformer (480/208)	N/A	775 (B) (42 pole)	885 (B) (84 pole)	1015 (B) (84 pole)	1135 (B) (84 pole)	N/A	N/A
Without transformer	N/A	495 (B)	495 (B)	525 (B)	525 (B)	N/A	N/A
With transformer (480/208), maintenance bypass, and filter	N/A	N/A	N/A	N/A	N/A	1300 (B)	1300 (B)
Power Distribution Unit Cabinets							
With transformer (480/208)	N/A	745 (B) (42 pole)	885 (B) (84 pole)	1015 (B) (84 pole)	1205 (B) (84 pole)	1375 (B) (84 pole)	1535 (B) (84 pole)
Without transformer	N/A	495 (B)	525 (B)	525 (B)	525 (B)	N/A	N/A

Note: Remote alarm panel, dc ground fault detector, and smoke detection unit add no more than 10 pounds to system weights.

HA4000 Cabinets Dimension Chart (all dimensions in inches)

	Height*	Depth	Width
Cabinet Size A	55.25	32.25	45.00
(shipping dimensions)	66.50	34.50	47.00
Cabinet Size B	55.25	32.25	31.50
(shipping dimensions)	66.50	34.50	33.50
Cabinet Size C	55.25	32.25	18.75
(shipping dimensions)	66.50	34.50	21.00
Cabinet Size D	55.25	32.25	52.00
(shipping dimensions)	66.50	34.50	–

* Add 2 inches for the permanent casters which come with the 11 kVA, 100 kVA, 125 kVA UPS units, and PDU cabinets.

Standard HA42A UPS Models

Model Number	Output Rating kVA/kW	Btu/Hour	Nominal Input Voltage (Volts)	Output Voltage (Volts)	Input CB Rating (Amps)
HA42A-AA	11/8.8	3,715	208	208Y/120	50
HA42A-AB	11/8.8	3,715	208	208Y/120	50
HA42A-AH	20/16	8,189	208	208Y/120	90
HA42A-BH	20/16	8,189	480	208Y/120	40
HA42A-CH	20/16	8,189	480	480Y/277	40
HA42A-AK	40/32	15,013	208	208Y/120	175
HA42A-BK	40/32	15,013	480	208Y/120	90
HA42A-CK	40/32		480	480Y/277	90
HA42A-AM	60/48	20,130	208	208Y/120	250
HA42A-BM	60/48	20,130	480	208Y/120	100
HA42A-CM	60/48	20,130	480	480Y/277	100
HA42A-AN	80/64	26,594	208	208Y/120	350
HA42A-BN	80/64	26,594	480	208Y/120	150
HA42A-CN	80/64	26,594	480	480Y/277	150
HA44A-CP	100/80	26,800	480	480Y/277	250
HA44A-CR	125/96	34,000	500	480Y/277	250

HA4000 Weight and Dimension Charts (dimension is indicated by small letter)

	Base System		Options					
			Auxiliary Cabinet				Distribution Cabinet	
kVA	UPS Cabinet	Battery Cabinet	w/F&T[1]	w/T	w/F	Empty	w/T	w/oT
11	1100(b)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
							42 Pole	
20	1075(b)	1820(b)	591(c)	450(c)	341(c)	200(c)	775(b)	495(b)
40	1385(b)	1995(a)	724(c)	550(c)	374(c)	200(c)	885(b)	495(b)
							84 Pole	
60	1725(a)	1995(a)	993(c)	720(c)	473(c)	200(c)	1015(b)	525(b)
80	2250(a)	2 × 1820(a)	1225(c)	850(c)	573(c)	200(c)	1135(b)	525(b)

[1] F = Filter; T = Transformer

	Actual Dimensions			Shipping Dimensions		
	Height	Depth	Width	Height	Depth	Width
size (a)	55.25	32.25	45.00	66.50	34.50	47.00
size (b)	55.25	32.25	31.50	66.50	34.50	33.50
size (c)	55.25	32.25	18.75	66.50	34.50	21.00

Note: Weight of remote status panel does not exceed 4.5 kg (10 lb).

Personal Series-PLUS Uninterruptible Power System

Product Description

The Personal Series-PLUS Single-Phase UPS, which replaces the HA1000, is available in two kVA ratings to accommodate the demands of small to mid-range Digital computers. The Personal Series-PLUS provides reliable blackout protection, plus power conditioning and power distribution for critical system applications. Its compact design, quiet operation, and portability make it equally suitable for use in a computer room or for supporting several small computer systems in an office environment.

In the event of a complete power blackout, the Personal Series-PLUS automatically obtains power from its storage battery and relays it to the computer system for six to ten minutes, without any interruption of the power supply to critical load. This allows time to ride out the outage, switch to an auxiliary power source, or perform a controlled shutdown of the system without any danger to valuable data.

In addition to battery backup protection, the Personal Series-PLUS also ensures that the ac power that reaches the computer system is clean, conditioned power. Its solid state inverter/charger filters and regulates the power from the commercial power source, protecting the system and its data from everyday power aberrations. A wide range of receptacles are also available to meet the power distribution needs, and are distributed by the PDM (power distribution module).

The Personal Series-PLUS offers microprocessor-controlled logic. This eliminates the need for manual adjustments to compensate for component tolerances, and facilitates maintenance and troubleshooting procedures. A 100 percent nonlinear (computer) load is supported without derating. An optional maintenance bypass switch is internal to UPS cabinet and allows uninterrupted transfer to utility power even while performing maintenance. The Personal Series-PLUS offers convenient plug-in connection to the critical load with receptacles on the power distribution module (PDM) on the back of the UPS unit; it may also be hardwired if desired.

The Personal Series-PLUS UPS is highly reliable. It operates as an online, fully automatic system in the following modes:

Normal Mode—In normal mode, the critical load is continuously controlled by the Personal Series-PLUS system's inverter/charger. The inverter/charger derives power as needed from the commercial power source, and supplies filtered, regulated ac power to the critical load. Simultaneous float-charging of the battery backup occurs during normal mode operation, as well.

Emergency—If the commercial ac power source fails, the inverter continues to supply the critical load with power from the Personal Series-PLUS storage battery without interruption.

Recharge—When the commercial ac power source is restored, the inverter/charger automatically recharges the storage battery with no interruption to the critical load.

Bypass—Bypass mode automatically transfers the critical load to the commercial ac power source when the Personal Series-PLUS is taken out of service for repair or maintenance. Transfer to bypass mode can also be initiated manually through the On/Off switch on the control panel.

Systems are truly worldwide with 176–276 V input at 50 or 60 Hz, three-phase or single-phase.

In case of emergency, an Emergency Power Off (EPO) switch located on the Personal Series-PLUS unit disconnects the critical load from both the UPS and the bypass. A Remote Power Off switch is also available as an option.

The full-featured front panel offers a communications interface which allows alarm conditions to be transmitted via an EIA-232C port to system status and a terminal, thus permitting monitoring of the system from a remote location.

	3.6 kVA	6.0 kVA	10.0 kVA	12.0 kVA
Input Characteristics				
Input voltage range	176–276 V	176–276 V	176–276 V	176–276 V
Frequency range	45–65 Hz	45–65 Hz	45–65 Hz	45–65 Hz
Power factor (with full load)	0.95	0.95	0.95	0.95
Surge protection	Meets IEEE 587; ANSI 62.41; Class A, B	Meets IEEE 587; ANSI 62.41; Class A, B	Meets IEEE 587; ANSI 62.41; Class A, B	Meets IEEE 587; ANSI 62.41; Class A, B
Battery Characteristics				
Battery voltage	10	26	25.5	20
Battery time @ half load, full load	6	10	9.5	6
Recharge time with standard battery	2 hours to 80%	2 hours to 80%	2 hours to 80%	2 hours to 80%
Recharge time with ext. battery 1	4 hours to 80%	4 hours to 80%	4 hours to 80%	4 hours to 80%
Recharge time with ext. battery 2	6.5 hours to 80%	6.5 hours to 80%	6.5 hours to 80%	6.5 hours to 80%
Life expectancy	5 years	5 years	5 years	5 years
Output Characteristics				
Output kVA/kW	3.6/2.4	6/4	10/7	12/8
Output voltage regulation	±2%	±2%	±2%	±2%
Output voltage THD	< 3% for 100% linear loads < 5% for 100% nonlinear loads with current crest factor = 3.1			
Overload capability	105% continuous 125% 10 minutes 150% 30 seconds	105% continuous 125% 10 minutes 150% 30 seconds	105% continuous 125% 10 minutes 150% 30 seconds	105% continuous 125% 10 minutes 150% 30 seconds
Power factor	67 lagging, 9 leading	67 lagging, 9 leading	67 lagging, 9 leading	67 lagging, 9 leading
Command mode noise	–120 dB	–120 dB	–120 dB	–120 dB
Transverse mode noise	–60 dB	–60 dB	–60 dB	–60 dB
Transient response	< 5% for 100% load step within 1 ms, full recovery within 1 cycle			
Frequency (free run)	±0.1 Hz	±0.1 Hz	±0.1 Hz	±0.1 Hz
Frequency (sync range)	±1.0 Hz	±1.0 Hz	±1.0 Hz	±1.0 Hz
Frequency (slew rate)	1 Hz/second	1 Hz/second	1 Hz/second	1 Hz/second
Environmental Specifications				
Ambient temperature Operating Storage	 10° – 40° C –20° – 60° C	 10° – 40° C –20° – 60° C	 10° – 40° C –20° – 60° C	 10° – 40° C –20° – 60° C
Operating humidity, noncondensing	0% – 95%	0% – 95%	0% – 95%	0% – 95%
Acoustic noise (on any surface at 1 meter and full load)	50 dB (3.6–6.0 kVA) 55 dB (8–12 kVA)	50 dB (3.6–6.0 kVA) 55 dB (8–12 kVA)	50 dB (3.6–6.0 kVA) 55 dB (8–12 kVA)	50 dB (3.6–6.0 kVA) 55 dB (8–12 kVA)
Operating altitude	1500 m (5000 ft)	1500 m (5000 ft)	1500 m (5000 ft)	1500 m (5000 ft)

(Continued)

(Continued)

	3.6 kVA	6.0 kVA	10.0 kVA	12.0 kVA	
Physical Specifications					
Weight	123 kg (270 lb)	123 kg (270 lb)	216 kg (475 lb)	216 kg (475 lb)	
Dimensions (W × D × H)	8.5 × 24.6 × 28.1 in. 216 × 625 × 714 mm		17 × 24.6 × 28.1 in. 432 × 625 × 714 mm		
Agency approvals	UL 1778 listed Canadian Standards Association (CSA) FCC Class A, Subpart J of Part 15 (Certified compliance) IEEE 587-1980 ANSI C62.41-1900 Standards for surge withstandability MTBF = 50K hours w/BP = 250K hours				

Options

4N-AEAAH-BB	3.6 kVA Basic with EPO/bypass
4N-AEAAH-BD	3.6 kVA Basic/FFP/EPO/bypass
4N-AEAAJ-BB	6 kVA Basic with EPO/bypass
4N-AEAAJ-BD	6 kVA Basic/FFP/EPO/bypass
4N-AEACH-BC	AST 6-foot input line cord 2-phase
4N-AEACH-BD	AST 6-foot input line cord 3-phase
4N-AEACH-BE	PDM 4 each 5–15R duplex outlets
4N-AEACH-BF	PDM 1 each L5–30R 3 each 5–15R
4N-AEACH-BG	PDM 2 each L5–30R 2 each 5–15R
4N-AEACH-BH	PDM 3 each L5–30R 1 each 5–15R
4N-AEACH-BJ	PDM 2 each L5–30R 2 each 5–15R
4N-AEACH-BK	PDM 4 each 5–20R
4N-AEACH-BL	PDM 2 each L6–30R
4N-AEACH-BM	PDM 4 each 6–15R
4N-AEACH-BN	PDM 1 each L6–15R 3 each 5–15R

Note: PDM = Output distribution model
EPO = Emergency power off
FFP = Fully featured front panel with LCD display and EIA-232
Basic = Basic panel without LCD display

4N-AEAAL-BA	10 kVA UPS with LCD display panel with 4N-AEACH-BB battery cabinet
4N-AEAAM-BA	12 kVA UPS with LCD display panel with 4N-AEACH-BB battery cabinet
4N-AEACH-BA	Extended battery cabinet/1 ECB1
4N-AEACH-BB	Extended battery cabinet/2 EBC2
4N-AEACK-BA	PDM for 4N-AEAAL/M-xx UPS units with 8 each 5–15R duplex outlets
4N-AEACK-BB	PDM for 4N-AEAAL/M-xx UPS units with 2 each L5–30R, 4 each 5–15R, 2 each L5-15R
4N-AEACK-BC	PDM for 4N-AEAAL/M-xx UPS units with 6 each L5–30R, 2 each 5–15R
4N-AEACK-BD	PDM for 4N-AEAAL/M-xx UPS units with 4 each 5–15R, 4 each L5–15R
4N-AEACK-BE	PDM for 4N-AEAAL/M-xx UPS units with 4 each L6–15R, 4 each 5–15R
4N-AEACK-BF	PDM for 4N-AEAAL/M-xx UPS units with 4 each 5–20R, 4 each 5–15R

The battery cabinet 1 is used only on the 3.6 and 6 kVA units as extended battery cabinets. The battery cabinet 2 will be shipped standard with the 8, 10, and 12 kVA versions. It can also serve as an extended battery cabinet on 3.6 through 12 kVA.

Personal Series—Uninterruptible Power Systems (UPS)

Product Description

Uninterruptible Power Systems (UPS) provides both power line conditioning and power outage protection of 5 to 15 minutes of emergency power backup at full load. The UPS continuously controls the flow of power to the computer in order to provide reliable, dependable operation.

Specially designed by Exide Electronics for small application environments, the new "true online" UPS is a compact, microprocessor-based system that brings the latest sine wave output technology to offices and small labs. Because of its "true online" configuration, the UPS provides not only continuous uptime during power outages, but also line conditioning for protection against surges, spikes, and other power irregularities that occur during a normal business day. The microprocessor-based electronics in the UPS ensure the high reliability of the system.

UPS provides protection for the following applications:

- Telecommunications/PBX
- Graphics workstations
- Computer terminals
- Local area networks (LANs)
- Personal computers
- Research/medical equipment
- Point-of-sale devices

Each UPS system comes with a three-year, return-to-factory warranty (which includes batteries). With Digital's "Hot Swap," a replacement unit can be received within 24 to 48 hours.

The Personal Series UPS is lightweight, portable, compact, quiet, and easy to use in either a vertical or horizontal position. They resemble a briefcase in size and can be easily installed by customers. They are ideal for LAN and rackmount installation with easy-to-install rackmount kits.

With the EIA-232 serial interface or LAN options (two dry contacts), system status and parameters are made available. The optional software kits enable communications with major operating systems. The software kits include OnliNet software, which will interface with SCO XENIX or SCO UNIX. With the software interface kit, automatic shutdowns can be initiated even in unattended settings.

On models 800 VA and above, systems are available with extended battery times of up to 28 minutes at half load or 15 minutes at full load.

Static Bypass allows the system to provide power to an application even during overload or failure of UPS.

Personal Series—Uninterruptible Power Systems (UPS)

Specifications

Models	350 VA	500 VA	800 VA	1000 VA	1500 VA	2000 VA
System Input Characteristics						
Volts	120 Vac + 10% to −18%				120 Vac + 10% to −20%	
Amps	4.5	5.6	8.4	10.3	12	16
Frequency	50 Hz or 60 Hz + 5% (Note 1)					
Cord	1.8-m (6-ft) cord with standard plug (5–15 P)				1.8-m (6 ft) (5–20 P)	
System Output Characteristics						
Volts	117 Vac +3% to −4%				120 Vac ± 3%	
Voltampere/Watts	350/200	500/325	800/525	1000/650	1500/1100	2000/1300
Amps/Continued	3.0	4.3	6.8	8.5	12	16
Amps/Peaks	9	13	20	25	35	47
Frequency	50 Hz or 60 Hz (Note 1) + 5% (Note 2) + 0.1% (Note 3)					
Receptacles	3 Receptacles (5–15 R)		6 Receptacles (5–15 R)		4 Receptacles (5–15 R)	
Environmental Specifications						
Temperature	0° C (32° F) to 40° C (104° F)					
Humidity	0% to 95% noncondensing					
Altitude	Maximum 2134 m (7000 ft)					
Projection						
Surge-Joules	200	200	200	200	200	200
Surge-Amps	6500	6500	6500	6500	6500	6500
Fusing-In	7 A	7 A	15 A	15 A	15 A	CB
Fusing-Out	5 A	5 A	12 A	12 A	12 A	CB
Elec. Noise at 100 kHz Normal Mode Common Mode	 80 dB 40 dB	 80 dB 40 dB	 80 dB 40 dB	 80 dB 40 dB	 80 dB 40 dB	 80 dB 40 dB
Weight and Dimensions						
Weight	6.4 kg (14 lb)		17.2 kg (38 lb)		29.2 kg (65 lb)	
Dimensions (W × D × H)	102 × 345 × 216 mm 4.0 × 13.6 × 8.5 inches		343 × 133 × 314 mm 13.5 × 5.25 × 12.4 inches		343 × 133 × 527 mm 13.5 × 5.25 × 22 inches	
With Extended Battery Time	Not Available		Extended battery time add 28 lb/12.7 kg 343 × 133 × 314 mm 13.5 × 2.6 × 12.4 inches		Extended Battery Time add 52 lb/23.5 kg 343 × 133 × 314 mm 13.5 × 5.2 × 12.4 inches	

Notes:

[1] Input frequency automatically sensed. Output frequency same as input.
[2] Normal operation; output synchronized to input.
[3] Input frequency out of acceptable limits or input not present.

Personal Series UPS Ordering Information

Personal UPS with Standard Battery				
	Basic System	**UPS with LAN**	**UPS with EIA-232**	**Rackmount Kit†**
350	4N-AEAAA-AA	4N-AEAAA-AK	4N-AEAAA-AF	4N-AEAEO-AF
500	4N-AEAAB-AA	4N-AEAAB-AK	4N-AEAAB-AF	4N-AEAEO-AF
800	4N-AEAAD-AB	4N-AEAAD-AK	4N-AEAAD-AF	4N-AEAEO-AG
1000	4N-AEAAE-AB	4N-AEAAE-AK	4N-AEAAE-AF	4N-AEAEO-AG
1500	4N-AEAAF-AC	*	4N-AEAAF-AF	4N-AEAEO-AG
2000	4N-AEAAG-AC	*	4N-AEAAG-AF	4N-AEAEO-AG
Personal UPS with Extended Battery‡				
800	4N-AEAAD-AG	4N-AEAAD-AJ	4N-AEAAD-AH	4N-AEAEO-AH
1000	4N-AEAAE-AG	4N-AEAAE-AJ	AN-AEAAE-AH	4N-AEAEO-AH
1500	4N-AEAAF-AG	*	4N-AEAAF-AH	4N-AEAEO-AH
2000	4N-AEAAG-AG	*	4N-AEAAG-AH	4N-AEAEO-AH

* All 1500 and 2000 units have LAN as standard feature (i.e., not able to order LAN separately).
† Rackmount kits consist of standard 19-inch racks, hardware and instructions.
‡ Extended battery model is not available in 350, 500.

Note: The following software kits are available for all systems.
- SCO XENIX software kit, 4N-AEAEO-AA
- SCO UNIX software kit, 4N-AEAEO-AB
- REMS software license, QL-VI5A9-AA
- REMS media (TK50) and documentation kit, QA-VI5AA-H5
- REMS media (magtape) and documentation kit, QA-VI5AA-HM

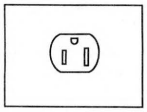
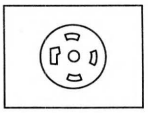
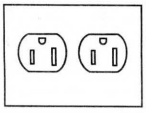
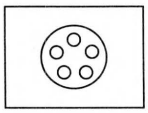
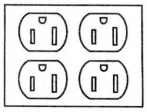
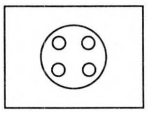
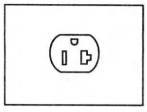
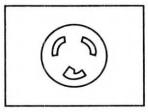
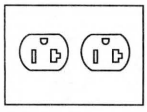
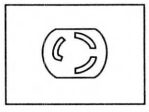
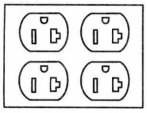
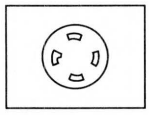
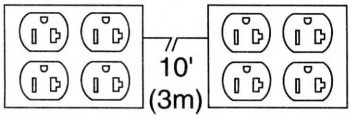
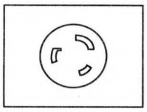
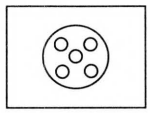
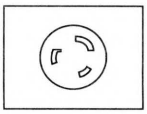
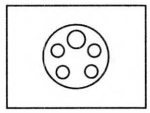
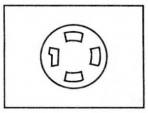
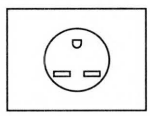
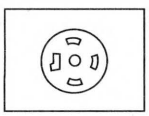
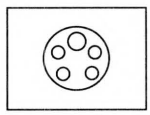
EIA-232 communications port provides communications with SCO UNIX and SCO XENIX software as well as VMS with REMS.

Selecting the Right Personal Series UPS

Digital System	UPS Size	Order Number
VAX/VAXserver 4000 Model 300	2000 VA	**4N-AEAAG-AC/XXX**
MicroVAX/VAXserver 3400, 3800	2000 VA	**4N-AEAAG-AC/XXX**
MicroVAX/VAXserver 3300	1000 VA	**4N-AEAAE-AB/XXX**
MicroVAX/VAXserver 3100 Model 10e	500 VA	**4N-AEAAB-AA/XXX**
MicroVAX/VAXserver 3100 Model 20e	800 VA	**4N-AEAAD-AB/XXX**
VAXft Systems	*Call for information*	
DECsystem 5800 Series Systems	*Call for information*	
DECsystem 5500 Systems	2000 VA	**4N-AEAAG-AC/XXX**
DECsystem 5400 Pedestal Systems	2000 VA	**4N-AEAAG-AC/XXX**
DECsystem 5400 Cabinet Systems	*Call for information*	
DECsystem 5100 Systems	500 VA	**4N-AEAAB-AA/XXX**
DECsystem 5000 Multiuser/Server	1500 VA	**4N-AEAAF-AC/XXX**
DECsystem 3100 Multiuser/Server	500 VA	**4N-AEAAB-AA/XXX**
VAXstation 3100 Model 30/38/76	800 VA	**4N-AEAAD-AB/XXX**
VAXstation 3100 Model 40/48	1000 VA	**4N-AEAAE-AB/XXX**
VAXstation 3520 and 3540	1500 VA	**4N-AEAAF-AC/XXX**
DECstation 5000	1500 VA	**4N-AEAAF-AC/XXX**
DECstation 3100	1000 VA	**4N-AEAAE-AB/XXX**
DECstation 2100	1000 VA	**4N-AEAAE-AB/XXX**
DEC PATHWORKS Server 3100	800 VA	**4N-AEAAD-AB/XXX**
DECstation PC Model 200, 300, 400	500 VA	**4N-AEAAB-AA/XXX**
DECserver 2000—6 Units	350 VA	**4N-AEAAA-AA/XXX**
DECserver 2000—10 Units	500 VA	**4N-AEAAB-AA/XXX**
DECserver 3000—4 Units	500 VA	**4N-AEAAB-AA/XXX**
DECserver 3000—7 Units	800 VA	**4N-AEAAD-AB/XXX**
DECserver 500 and 550	1000 VA	**4N-AEAAE-AB/XXX**
VT1300	500 VA	**4N-AEAAB-AA/XXX**
VT1200	350 VA	**4N-AEAAA-AA/XXX**

Note: Additional drives or equipment may change your power capacity requirements. Contact a Customer Services engineer for configuration assistance.

Receptacle Reference Chart

RECEPTACLE TYPE	PART NO. ①	RECEPTACLE TYPE	PART NO. ①
 NEMA No. 5-15R	BC24J-xx	 NEMA No. L21-30R	BC24W-xx
 NEMA No. 5-15R(2)	BC24K-xx	 ZPLT-6C24-49PR	BC24X-xx
 NEMA No. 5-15R(4)	BC24L-xx	 RUSSELL STOLL 7428	BC26D-xx
 NEMA No. 5-20R ②	BC24M-xx	 NEMA No. L6-30R	BC26E-xx
 NEMA No. 5-20R(2) ②	BC24N-xx	 NEMA No. L5-15R	BC26F-xx
 NEMA No. 5-20R(4) ②	BC24P-xx	 NEMA No. L14-30R	BC28Z-xx
 NEMA No. 5-20R Dual ② Duplex 10 ft. (3 m) apart, NEMA No. 5-20R(8) ②	BC24R-xx		
 NEMA No. L5-30R	BC24S-xx	 RUSSELL STOLL DF6516FP	BC29A-xx
 NEMA No. L6-20R	BC24T-xx	 HUBBELL No. 5609CW	BC29B-xx
 NEMA No. L14-20R	BC24U-xx	 NEMA No. 6-15R	BC29C-xx
 NEMA No. L21-20R	BC24V-xx	 HUBBELL No. 51009CW	BC29D-xx

BU-3162

① Refer to U.S. price list for cable lengths. xx denotes cable length, where:

-10 = 10 ft (3 m)	-60 = 60 ft (18.3 m)
-20 = 20 ft (6 m)	-70 = 70 ft (21.3 m)
-30 = 30 ft (9.1 m)	-80 = 80 ft (24.4 m)
-40 = 40 ft (12.2 m)	-90 = 90 ft (27.4 m)
-50 = 50 ft (15.2 m)	-A0 = 100 ft (30.5 m)

② U.S. only. For Canada, order BC28D for BC24M; BC28E for BC24N; BC28F for BC24P; BC28G for BC24R.

Chapter 6
Networks, Communications, and Cables

LAN Communications Controllers

Local and Wide Area Communications Servers

Host-Based Communications Controllers

Network Connectivity Products

DECtalk Speech Synthesizers

Cables

VAX/DECsystems LAN Communications Controllers Summary Chart*

LAN Type	Bus	Controller	Number of Lines	Maximum Speed	LAN Connection	Protocol Support	Operating System Support
802.3/ Ethernet	XMI	DEMNA	1	10 Mb/s	Standard AUI	DECnet-VAX, DECnet-ULTRIX	VMS, ULTRIX
802.3/ Ethernet	VAXBI	DEBNI	1	10 Mb/s	Standard AUI	DECnet-VAX, DECnet-ULTRIX	VMS, ULTRIX
802.3/ Ethernet	Q-bus systems in BA2xx-series enclosures	DESQA	1	10 Mb/s	Standard AUI or ThinWire BNC	DECnet-VAX, DECnet-ULTRIX	VMS, ULTRIX
802.5 Token Ring	Q-bus	DEQRA	1	4/16 Mb/s	DB9	DECnet	VMS
FDDI	XMI	DEMFA	1	100 Mb/s	SAS, Fiber MIC	DECnet	VMS
FDDI	TURBOchannel	DEFZA	1	100 Mb/s	Fiber: SAS, Fiber MIC Copper: ThinWire or STP	DECnet, OSI, TCP/IP	ULTRIX

* Additional controllers available; see the *Networks Buyer's Guide* for information. For PC LAN controller information, see Chapter 3.

DEC LANcontroller 400 (DEMNA—XMI)

The DEC LANcontroller 400 (DEMNA) is a high-performance XMI-to-Ethernet controller. The DEMNA is a single board option. The module uses an onboard CVAX processor to control data flow and 512 Kbytes of memory for packet buffering and processing.

The DEC LANcontroller 400 enables a VAX 10000/9000/7000/6000 system to operate as a boot member of a Local Area VAXcluster. Additional controllers can be installed in these systems to establish communications with multiple independent Ethernet segments.

Prerequisites

Hardware: DEMNA connects to the network via an Ethernet transceiver and transceiver cable. The cabinet kit, transceiver cable, and transceiver are ordered separately.

Software: The DEC LANcontroller 400 is supported under DECnet Phase IV and IEEE 802.3 software. Refer to the VMS, ULTRIX, LAT, DECnet, and Local Area VAXcluster Software Product Descriptions.

Ordering Information

The DEC LANcontroller 400 is supported on VAX 10000/9000/7000/6000 systems. When purchased as an add-on, a cabinet kit must also be ordered. This option requires Digital Services installation.

DEMNA-M	VAX XMI Ethernet adapter without cables
CK-DEMNA-KD	VAX 6000 cabinet kit, 3-ft (0.91-m) cable
CK-DEMNA-KE	VAX 9000 cabinet kit, 3-ft (0.91-m) cable
CK-DEMNA-KN	VAX 10000/VAX 7000 cabinet kit
CK-DEMNA-AM	VAX 6000/VAX 9000 local console cabinet kit

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @				
		5 V	12 V	−12 V	−5.2 V	−2 V
DEMNA-M	1 XMI slot	7.75	0.60	0.10	0.0	0.0

DEC LANcontroller 200 (DEBNI—VAXBI)

The DEC LANcontroller 200 (DEBNI) 802.3/Ethernet-to-VAXBI communications controller connects VAXBI systems to 802.3/Ethernet local area networks. An enhanced version of the DEBNA, it offers two to three times more throughput for small Ethernet packets and has ROM-based console functionality to monitor DEBNI and Ethernet use.

The DEC LANcontroller 200, available as a module or as a ROM upgrade kit for the DEBNA, supports one Ethernet port. It sends and receives signals at 10 Mbits per second. Actual device throughput depends on the system configuration, packet sizes, and application in use.

Prerequisites

Hardware: The DEC LANcontroller 200 connects to the Ethernet via an Ethernet transceiver and transceiver cable. The cabinet kit, transceiver cable, and transceiver are ordered separately.

Software: Refer to the VMS, LAT, DECnet, Local Area VAXcluster, VAXELN, and ULTRIX Software Product Descriptions.

Ordering Information

DEBNI-M	Includes base module only. For system installation, order CK-cabinet kits.
DEBNI-UA	4-ROM upgrade to the DEBNA-M, no cabinet kit required.
CK-DEBNA-LD	For use with VAX 6000 series internal VAXBI channels.
CK-DEBNA-LJ	For use with VAX 6000 series external VAXBI channels.

Note: Internal channels are built into the CPU cabinet, and external channels are located within the expansion cabinet. Cabinet kit consists of internal cable, I/O connector panel, and console-enable jumper for Ethernet.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					Cable Length		VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V	m	[ft]		
DEBNI-M	1 VAXBI slot	6.72	0.00	0.00	0.00	0.00			1	none
CK-DEBNA-LD	none	0.00	0.00	0.00	0.00	0.00	1	[3]	0	1
CK-DEBNA-LJ	none	0.00	0.00	0.00	0.00	0.00	1.5	[5]	0	1

* Panel contains Ethernet transceiver power LED and fuse.

DESQA Controller (Q-bus)

The DESQA is an Ethernet-to-Q-bus communications controller that connects VAX, Q-bus, MicroVAX, DECsystems, and MicroPDP-11 systems that use the BA4xx or BA2xx series enclosures to an Ethernet V2.0 or IEEE 802.3 local area network. The DESQA can be connected to standard Ethernet coaxial cable or to ThinWire Ethernet. The DESQA is a combination of DELQA and DESTA on one quad-height BA2xx series form-factor module. DESQA does not require a cabinet kit.

Prerequisites

Hardware: One ThinWire BNC T-connector and two 50-ohm terminators are supplied with the DESQA. The DESQA physically and electrically connects to the IEEE 802.3/Ethernet via transceiver cable—BNE3K or BNE3M series (thick wire) or the BC16M-x series (ThinWire). In the case of ThinWire connections, the DESQA must be connected via a DEMPR or a DESPR. For thick wire baseband connections, DESQA can be connected to an H4005 or DELNI. For broadband connections DESQA can be connected to a DECOM. The H4005, DECOM, DELNI, DEMPR, DESPR, and cable must all be ordered separately.

Software: DESQA is compatible with all DELQA software drivers.

Ordering Information

DESQA-SA/SF	Ethernet-to-Q-bus communications controller for VAX 4000, Q-bus MicroVAX 3000 series, and Q-bus DECsystems. Factory/field installed.
EK-DESQA-TM	*DESQA Technical Manual.*

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DESQA-Sx	1	2.4	0.22	14.64	3.3	0.5

DEC TRNcontroller 100 (DEQRA—Q-bus)

The DEC TRNcontroller 100 is a Q-bus adapter that enables MicroVAX 3xxx and VAX 4000 systems to connect to a 4- or 16- Mb/s 802.5/Token Ring network. The DEQRA, in combination with the DEC Token Ring Network Device Driver for VMS V1.0 (TRDRV V/V), enables these systems to act as DECnet Phase IV full-function nodes and interoperate with other DECnet Phase IV systems on either 802.5/Token Ring or Ethernet LANs. When configured with PATHWORKS for VMS V4.1, these systems can act as PC LAN servers for PATHWORKS clients on either 802.5/Token Ring or Ethernet LANs. The TRDRV V/V driver kit includes online diagnostics, installation verification procedures, and the DEQRA-CA host-loadable microcode. The DEQRA supports shielded twisted-pair connection only, and provides an EIA-232 console port for debugging purposes.

Prerequisites

Software: VMS V5.4-3 and associated DECnet-VAX

Hardware: The DEQRA physically and electrically connects to the 802.5/Token Ring shielded-twisted pair cable. These connection components are not included with the DEQRA-CA and must be ordered separately.

Ordering Information

Order the DEQRA-CA as a field-installable controller. This controller is not currently available as a factory-installed option.

DEQRA-CA	Field-installed DEQRA (includes VMS device driver license)
BC29E-15	Debugging console cable
QA-GVJAA-GZ	TRDRV V/V documentation

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @		Bus Loads Drawn	
		5 Vdc	12 Vdc	ac	dc
DEQRA	1 quad slot	4.0A	0.1A	5	2

DEC FDDIcontroller 400 Controller (DEMFA—XMI)

The DEC FDDIcontroller 400 enables VAX 10000/9000/7000/6000 systems and servers to operate as native FDDI SAS devices, via an FDDI concentrator, in a high-speed FDDI ring. The DEC FDDIcontroller 400 consists of three components:

- A single XMI module, with the system interface and FDDI logic
- An active I/O bulkhead assembly that houses the fiber optic transceiver and electrical interface
- A woven cable to interconnect the XMI module and bulkhead assembly

The DEC FDDIcontroller 400 uses an ANSI-standard MIC (Media Interface Connector) to provide optical interconnection to a fiber cable attached to any ANSI-compliant FDDI concentrator, such as the DECconcentrator 500.

The DECconcentrator 500 connects Digital's FDDI devices, as well as ANSI-compliant devices from other vendors, in an FDDI physical star or logical ring topology.

Features

- Full-performance FDDI interface—provides necessary speed for support of network-intensive applications
- VMS load balancing/auto-failover to second FDDI adapter or Ethernet—assures network availability to systems and servers using adapter

DEC FDDIcontroller 400
(Continued)

- Firmware downline loadable (retained in non-volatile RAM)—supports currency with FDDI standards and easy upgrades for new features and capabilities

Prerequisites

Hardware

- The DEC FDDIcontroller 400 adapter for VAX 10000/9000/7000/6000 platforms provides a Single Attachment Station (SAS) connection. It requires a concentrator for connectivity to the FDDI LAN.
- The DEC FDDIcontroller 400 must have a corresponding concentrator port card providing the same media interface for 62.5-micron multimode fiber.

Software: VMS Version 5.4-3 provides DECnet Phase IV and LAT support for the DEC FDDIcontroller 400. Included in VMS V5.4-3 is the ability to diagnose network problems and manage the adapter via the Network Control Program (NCP) and System Dump Analyzer (SDA).

Ordering Information

DEMFA-AA	XMI-to-FDDI SAS adapter for use on VAX 6000/VAX 7000/ VAX 10000 systems*
DEMFA-AB	XMI-to-FDDI SAS adapter for use on VAX 9000 systems*

* Includes single-use license for DEC FDDIcontroller 400 software microcode.

Configuring Information

Requires one XMI slot; one I/O panel unit required for VAX 9000 systems, two I/O panel units for VAX 6000/VAX 7000/VAX 10000 systems. Maximum three per VAX 9000 system, two per VAX 6000/VAX 7000/VAX 10000 system.

DEC FDDIcontroller 700 Controller (DEFZA—TURBOchannel)

The DEC FDDIcontroller 700 enables the direct connection of Digital workstations (presently supported on the DECstation/DECsystem 5000 and VAXstation 4000 60/90 with TURBOchannel adapter) to Fiber Distributed Data Interface (FDDI) networks. FDDI is a dual-ring, timed token-passing network technology with a 100-Mbit data rate, ten times the rate of current IEEE 802.3/Ethernet offerings. It consists of two piggy-backed cards (11.7 by 14.4 cm [4.600 by 5.675 inches]) that plug directly into one slot of the CPU's TURBOchannel bus interface.

The DEC FDDIcontroller 700 attaches directly to the FDDI ring through the DECconcentrator 500 as a Single Attachment Station (SAS). SAS workstation connection provides the end user with added protection from network disruption and allows network configurations that are more flexible and manageable.

The DEC FDDIcontroller 700-C supports 100 Mbit/second FDDI signaling over ThinWire and Shielded Twisted Pair (STP) at distances up to 100 meters. This optional use of copper wiring for FDDI provides lower-cost FDDI connectivity for TURBOchannel-based workstations and servers. The DEC FDDIcontroller 700-C for TURBOchannel-based products has connections for either 150-ohm Type 1, 2, and 6 STP, or 50-ohm ThinWire coaxial cable, and is switch-selectable between the two.

Prerequisite Hardware

The FDDIcontroller 700-C adapter for the DECstation 5000/DECsystem 5000 and VAXstation 4000 60/90 systems is a SAS connection. As such, it requires a concentrator. In supporting copper, either ThinWire or STP, the controller and concentrator device must be matched to provide the same interface as the selected physical media. DECconcentrator (DEFCN-Ax or DEFCN-Bx) requires firmware revision 3.0 or higher to support copper options. Units shipped before June 1991 require a firmware upgrade kit. Refer to the *Networks Buyer's Guide* for details.

Ordering Information

DEFZA-AA	DEC FDDIcontroller 700 fiber optic version
DEFZA-CA	DEC FDDIcontroller 700-C copper version

802.3/Ethernet Terminal Server Selection Guide

	DECserver 90L+ (DSRVG)	DECserver 90TL (DSRVE)	DECserver 700 (DSRVW)	MUXserver 320/380 (DSRZE/DSRZD)
Applications				
Local Connectivity				
• PC (terminal emulation)	Y	Y	Y	Y
• PC (file transfer)	N	Y	Y	N
• Terminal (asynchronous)	Y	Y	Y	Y
• Serial printers	Y	Y	Y	Y
• X Window terminal (E-net interface)	N	N	N	N
• X Window terminal (asynchronous interface)	Y	Y	Y	Y
Remote Connectivity	N	Y (individuals)	Y (individuals)	Y (individuals/groups)
Number of ports (asynchronous)	8	8	8/16	32/128
Network protocol support	LAT	LAT Telnet SLIP	LAT Telnet SLIP	LAT Telnet
Modem control	N/A	Limited	Full (8 line) Limited (16 line)	Full with DB25
I/O connectors	MMJ	RJ45/MJ8	DB25 (8 line) RJ45/MJ8 (16 line)	DB25/MMJ
Maximum line speed/throughput	38.4 Kb/s 35 Kb/s	57.6 Kb/s 30 Kb/s	115.2 Kb/s 215 Kb/s	19.2 Kb/s 19.2 Kb/s
Ethernet interface	ThinWire DEChub 90	ThinWire DEChub 90	Standard E-net (AUI) Unshielded Twisted Pair (UTP)	Standard E-net (AUI) ThinWire
Load host support	N/A (ROM based)	VMS VAX/ULTRIX RISC/ULTRIX MS-DOS UNIX	VMS VAX/ULTRIX RISC/ULTRIX MS-DOS UNIX	VMS ULTRIX
Management	SNMP (via agent) TSM Remote console	SNMP TSM Remote console	SNMP TSM Remote console	TSM
Password protected	Y	Y	Y	Y
Multiple LAT sessions/port	4	8	8	8
VT420/VT330/VT340 dual sessions	N	Y	Y	Y
Dedicated/prefered service	Y	Y	Y	Y
Group codes	N	Y	Y	Y
Mounting options	Tabletop DEChub 90	Tabletop DEChub 90	Tabletop Rack	Tabletop Rack

DECserver 90TL Telnet/LAT Terminal Server

Designed for high-speed asynchronous connections to UNIX, ULTRIX, VMS, DOS, and multivendor network services, the DECserver 90TL delivers the performance of a mid-range terminal server in a compact, low-cost module. This eight-port Telnet/LAT terminal server offers industry-standard connections at speeds of up to 57.6 Kb/s. It supports TCP/IP, Telnet, LAT, and SLIP protocols and several remote management systems. Like other members of the WorkGroup Family of Networking Products, it can be used interchangeably as a standalone unit and in the DEChub 90.

The server's support for TCP/IP-Telnet and Domain Name Service (DNS) protocols provides for multivendor connectivity and wide area terminal service. LAT protocol, a highly efficient local area terminal service, accommodates a variety of host systems from Digital and other vendors.

With TCP/IP-SLIP, the DECserver 90TL becomes a static IP end-node router for PCs connected to the serial ports. The server provides TCP/IP communications to connect these PCs to each other and to any service on the network. These low-cost connections, via a telephone line and modem, are excellent for connecting branch and other remote operations.

The DECserver 90TL can be managed in a variety of network environments using SNMP or MOP, which are integral to the server. Terminal Server Manager (TSM) V1.5, Telnet Remote Console, and MOP Remote Console are useful for checking status or reconfiguring the server remotely.

Several productivity-enhancing features are included. With one server, users can simultaneously access 64 different sessions operating under a mix of protocols. This minimizes the need to log in and out of sessions. The server supports Terminal Device/Session Management Protocol (TD/SMP). Its preferred service feature expedites connections to specific services. On-demand font loading, especially useful for Asian terminals that require dynamic font capabilities, is also included.

Industry-standard MJ8 (RJ45-style) connectors provide data, DSR, and DTR signals to most modems and printers. As an added security feature, system managers can dedicate a port to just one service, or assign group codes to restrict access to network services.

New DECserver software, also used with the DECserver 700 series, can be down-line-loaded from ULTRIX, UNIX, VMS, or MS-DOS (via PATHWORKS for DOS) operating systems using BOOTP/TFTP or MOP. The server software license is included with the DECserver 90TL.

Features

- Multiprotocol capabilities—Supports Telnet, LAT, TCP/IP and SLIP protocols
- Configuration flexibility—Operates standalone or in the DEChub 90
- Investment protection—Features upgradeable software and memory
- Network management—Manageable remotely using SNMP, Terminal Server Manager (TSM) V1.5, MOP Remote Console, and Telnet Remote Console
- High speed—Supports high bandwidth asynchronous devices at speeds of up to 57.6 Kb/s
- Modem/printer/device control—Uses industry-standard MJ8 (RJ45-style) connections that provide data, DSR, and DTR signal capabilities
- Ease of use—Features front panel LEDs to provide port, module, and network status and activity at a glance

DECserver 90TL Telnet/LAT
(Continued)

DECserver 90TL for standalone use; includes power supply.
Note: Server software license included with purchase.

Ordering Information

DSRVE-AA	U.S., Canada, Japan
DSRVE-AD	Denmark
DSRVE-AE	U.K.
DSRVE-AI	Italy
DSRVE-AK	Switzerland
DSRVE-AT	Israel
DSRVE-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DSRVE-AZ	Australia
DSRVE-BJ	India
DSRVE-MA	DECserver 90TL for use with DEChub 90 (power supply not included)
H7082-AA	120-V power supply with internal power connection
H7082-AB	240-V power supply with IEC connection
H0342-AA	Snap-on cover for hub-based model of the DECserver 90TL

Note: Prefix the DECserver 90TL order code with DL- to order 24 units.

QA-MJPAA-Hx	DECserver media and documentation kit (VMS)
QA-MJPAB-Hx	DECserver media and documentation kit (ULTRIX)
QA-MJPAC-HB	DECserver media and documentation kit (DOS-RX24)
QA-MUPAC-HB	DECserver 90TL media and documentation kit (DOS-RX24)
QA-MUPAD-HC	DECserver 90TL media and documentation kit (UNIX-RX23)
QA-MUPAD-HP	DECserver 90TL media and documentation kit (UNIX-QIC)

Note: x = media; 5 = TK50; M = 1600-bit/in. magtape

Configuring Information

The DECserver 90TL features eight MJ8 (RJ45-style) connectors that support asynchronous device connections. It has an integral BNC for connection to ThinWire Ethernet, a connector for insertion into the DEChub 90, and a connector for the standalone power supply. Eight DECserver 90TL modules in the hub provide 64 connections; two interconnected DEChub 90 units can support 128 connections. The DECserver 90TL can also be combined with WorkGroup Family repeaters, bridges, and LAT-only terminal servers in the DEChub 90.

Specifications

Dimensions:	3.2 × 27.9 × 14.0 cm (1.25 × 11 × 5.5 in.)
Weight (without power supply):	0.77 kg (1.7 lb)
Connectors:	• ThinWire BNC for Ethernet • 8 MJ8 connectors (RJ45-style) for asynchronous lines • standalone power supply
Software:	DECserver downline-loadable software
Load hosts:	ULTRIX/RISC, ULTRIX/VMS, UNIX, VMS, and PATHWORKS for DOS
Protocols:	Telnet, TCP, UDP, IP, ARP, SLIP, LAT, BOOTP/TFTP, SNMP, DNS, TD/SMP (initial software release)
Port speeds:	Autobaud or user selectable from 75 b/s to 57.6 Kb/s
Characters:	7 or 8 bit characters, 1 or 2 stop bits
Parity:	None, even, odd, space, mark
Flow control:	XON-XOFF or DSR/DTR (2-wire)
Maximum throughput:	30K cps
Operating temperature:	5°–50°C (41°–122°F); convection cooled

DECserver 90L+ Terminal Server

The DECserver 90L+ is a feature-enhanced LAT terminal server for 802.3/ Ethernet local area networks. Like other modules in Digital's WorkGroup Family, it can be used interchangeably in standalone and hub-based configurations to accommodate both small workgroups and large departments.

This terminal server replaces the DECserver 90L. It adds many software enhancements. Its high throughput delivers optimal line speed capabilities, up to 38.4 Kb/s, for eight interactive terminals, serial printers, and PCs (in terminal emulation mode).

The DECserver 90L+ can connect to up to four different services per port. It provides both dedicated and preferred services. The dedicated service feature allows a port to be connected to only that service name specified by the system manager. The preferred service feature allows a user to predefine a frequently used service and, thereafter, to connect to that service without specifying its name.

The DECserver 90L+ also offers basic session management and security features. For example, if a terminal is powered off while sessions are still active, the terminal server will disconnect the session on the host, preventing other users from accessing another individual's session. If a printer is powered off, the DECserver 90L+ can notify and stop the print queue on the host system, preventing print jobs from being lost. Also included are diagnostic and management features, including the ability to examine and modify the server and port parameters.

Features

- Multi-session support—Each port can initiate up to four sessions
- Provides dedicated and preferred services
- Features command line recall and edit
- Network management—Supports Terminal Server Manager (TSM) V1.6 for configuring, monitoring and management
- Allows user to initiate connection to any device supporting MOP console carrier
- Easy to use—Features simple commands, preset parameters, and menu-driven setups
- Plug-and-play—Supports autobaud; factory configured for immediate use
- Built-in ROM-based software eliminates the need to downline load server software from a host system
- Ease of management—Front panel LEDs indicate status of power, self-test, network connection, and data flow
- Supports LAT protocol—Performs in widely supported Ethernet environments to provide efficient connections to network services
- Printer support—Supports XON and XOFF, and distributed LAT queuing
- Port customization—Users can set port name, speed, flow control, device type, and action on break; port characters can be set remotely

DECserver 90L+ *(Continued)*

Ordering Information

DECserver 90L+ for standalone use; includes power supply.

DSRVG-AA	U.S., Canada, Japan
DSRVG-AD	Denmark
DSRVG-AE	U.K.
DSRVG-AI	Italy
DSRVG-AK	Switzerland
DSRVG-AT	Israel
DSRVG-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DSRVG-AZ	Australia
DSRVG-BJ	India
DSRVG-MA	DECserver 90L+ for use with DEChub 90 (power supply not included)
H7082-AA	120-V power supply with internal power connection
H7082-AB	240-V power supply with IEC connection
H0342-AA	Snap-on cover for hub-based model of the DECserver 90L+

Note: Prefix the DECserver 90L+ order code with DL- to order 24 units.

Configuring Information

The DECserver 90L+ has an integral BNC for connection to ThinWire Ethernet and a connector for insertion into the DEChub 90.

Users can easily connect up to eight asynchronous devices to the MMJ jacks and immediately have communications in operation, without complicated configuration setups or software expertise. Up to eight DECserver 90L+ modules can be snapped into the DEChub 90 backplane to provide 64 connections for terminals and printers, and PCs in terminal emulation mode.

Specifications

Dimensions:	3.2 × 27.9 × 14.0 cm (1.25 × 11 × 5.5 in.)
Weight:	0.77 kg (1.7 lb)
Input connectors:	ThinWire Ethernet and 8 MMJ jacks
Resident firmware:	LAT
Baud rates:	User selectable from 1.2 Kb/s to 38.4 Kb/s
Parity:	8-bit characters; 1 stop bit; no parity
Protocol:	XON-XOFF
Current:	+5 Vdc from ac line transformer
Environmental class:	C

DECserver 700 Ethernet Communications Server

DECserver 700 Ethernet Communications Servers offer superior price/performance over their predecessors. They provide the flexibility to adapt new network applications via software enhancements and customer-installable hardware upgrades. The DECserver 700 implementation of TCP/IP protocols (including Telnet, Serial Line Internet Protocol—SLIP, and Simple Network Management Protocol—SNMP) and LAT demonstrates Digital's commitment to "open" network protocols and to the delivery of information system solutions across any vendor's platforms.

DECserver 700 replaces both the DECserver 200 and 300 models and due to its superior performance, implementation of TCP/IP and expandability, multiple DECserver 700s are the preferred solution to the DECserver 550.

The DECserver 700 is less than half the size of its predecessors, the DECservers 200 and 300, at 4.4 × 44.2 × 28.2 cm (1.75 × 17.4 × 11.1 in.), 3.2 kg (7 lb.).

The DECserver 700 comes in two versions: a 16-port limited modem control version and an 8-port full modem control version. The 16-port version uses RJ45/MJ8 connectors and supports most Hayes-compatible modems and Digital's DECmodem V.32 and Scholar Plus modems. Transmit (±) and Receive (±) signaling options are provided, as are the following control signals for low- to medium-speed (<9600-bit/s) asynchronous modems: Data Carrier Detect (DCD),

DECserver 700 *(Continued)*

Data Set Rate Selector (DSRS), Data Terminal Ready (DTR), and Ring Indicator (RI). Additionally, for medium- to high-speed (>9600-bit/s) asynchronous modems, the following control signals are supported: Clear-To-Send (CTS), Data Set Ready (DSR), Data Terminal Ready (DTR), and Request-To-Send (RTS).

The DECserver 700 8-port version uses EIA-232/DB25 connectors and provides full modem control for modems that meet Bell 103, 212, and CCITT V.21, V.22, and V.32 specifications. This model is recommended for network connection of devices that require full EIA-232 signaling, such as industrial instrumentation.

Both DECserver 700 versions deliver line speed and character throughput of 115.2 Kbits per second per line and 215K characters per second total aggregate throughput. They directly support thick wire Attachment Unit Interface (AUI) and 10BaseT Unshielded Twisted Pair (UTP) 802.3/Ethernet connections. For ThinWire Ethernet connections, an AUI-to-ThinWire MAU (Media Access Unit) is required (DW29-AA).

DECserver 700 supports 1 to 8 Mbytes of user-installable memory to assure investment protection and to take advantage of future communications protocols and applications. The DECserver 700 is easily managed by the DECmcc management platforms and SNMP.

The DECserver 700 SLIP implementation combined with the hardware platform's superior throughput and line speed makes the DECserver 700 an ideal, low-cost solution for local and remotely connected PCs. A single Ethernet address can support all 16 ports as IP addresses, eliminating the need for costly PC LAN implementations. PCs can access network resources and perform efficient file transfer and virtual terminal operations.

DECserver 700 software is available on 5.25-inch diskette, "TK" tape cassettes, CD-ROM, etc., for VMS, ULTRIX/UNIX, DOS, and SCO/Unix hosts. The "Open Advantage" characteristics of this platform are evidenced by its ease of use in non-DEC environments.

Features

- Designed for rack, tabletop, or wall-mounting
- Superior performance → 115.2 Kbits per second per port speeds, 250K characters per second aggregate throughput
- Complete TCP/IP support → Telnet, Serial Line Internet Protocol (SLIP), manageable via SNMP
- Platform is expandable → to 8 Mbytes of memory for future applications
- Replaces the DECserver 200 and 300 models

Ordering Information

DSRVW-A*	DECserver 700, eight EIA-232 ports with DB25 connectors for full modem control, 1-Mbyte memory, accessory kit, software license, manual, U.S. power cord.
DSRVW-B*	DECserver 700, eight EIA-232 ports with DB25 connectors for full modem control, 1-Mbyte memory, accessory kit, software license. Manual and power cord not included.
DSRVW-C*	DECserver 700, 16 EIA-232 ports with MJ8/RJ-45 connectors (eight wires), 1-Mbyte memory, accessory kit, software license, manual, U.S. power cord.
DSRVW-D*	DECserver 700, 16 EIA-232 ports with MJ8/RJ-45 connectors (eight wires), 1-Mbyte memory, accessory kit, software license. Documentation and power cord not included.

* DECserver 700s are offered in single units or in kits of ten units at a discounted price. Replace the * with A for single unit order or M for a multipack of 10.

Ordering Information *(Continued)*

DSRVW-xx DECserver 700 country kit with power cord and manual

(xx = **KD** for Denmark, **KE** for U.K./Ireland, **KG** for Germany/Austria, **KI** for Italy, **KJ** for Japan, **KT** for Israel, **KZ** for Australia/New Zealand, **LJ** for India, **MA** for Belgium/Finland/France/Holland/Norway/Spain/Sweden, **MB** for Switzerland.

QL-XA5A*-xx DECserver 700 software license

* = **A** for VMS, **B** for ULTRIX, **C** for MS-DOS

QA-XA5A*-xx DECserver 700 media and documentation

* = **A** for VMS, **B** for ULTRIX, **C** for MS-DOS;
xx denotes media type: H5 = TK50, HM = magtape, HB = RX24

DW29-AA AUI-to-ThinWire Media Access Unit (MAU)

For new or rewired installations, use the following adapters and cables with the DECserver 700.

To Connect	To DECserver 700 (16-port)	To DECserver 700 (8-port)
Terminal/printer with MMJ port	**BN24H-xx** cable	**H8575-A** adapter and **BC16E-xx** cable
Terminal/printer with DB25 male port	**H8575-A** adapter and **BN24H-xx** cable	**BC17D-xx** (10 wire) cable or **BC22D-xx** (6-wire) cable
Terminal/printer with DB9 male port	**H8575-B** adapter and **BN24H-xx** cable	**H8575-A** and **H8571-J** adapters and **BC16E-xx** cable
PC communication interface with DB9 male port	**H8585-AA** adapter and **BN25G-xx** cable	**H8575-A** and **H8571-J** adapters and **BC16E-xx** cable
Modem (<9600 b/s) with DB25 female port	**H8585-AB** adapter and **BN25G-xx** cable	**BC22E-xx** (10-wire) cable or **BC22F-xx** (25-wire) cable
Modem (=>9600b/s) with DB25 female port	**H8585-AC** adapter and **BN25G-xx** cable	**BC22E-xx** (10-wire) cable or **BC22F-xx** (25-wire) cable
Non-Digital systems with DB25 male ports (reverse-LAT configuration)	N/A	**BC22R-xx** cable

For upgrades where existing cabling will be maintained, use the following adapters with the DECserver 700.

To Upgrade From	To	Use
DECserver 300 with ThinWire Ethernet connection	DECserver 700 (16-port)	**H8584-AA** adapters (one per port) and **DW29-AA** AUI-to-ThinWire adapter)
DECserver 300 with standard Ethernet connection (15-pin)	DECserver 700 (16-port)	**H8584-AA** adapters (one per port)
DECserver 200/DL	DECserver 700 (16-port)	**H8584-AA** adapters (one per port)
DECserver 200/MC (and other terminal servers with DB25 ports)	DECserver 700 (8-port)	No additional adapters required

DECserver 250 Communications Server

The DECserver 250 network server is dedicated to providing Ethernet connection for both parallel and serial printers. It is a high-performance, full-function, Ethernet-based server for printers that provides the interface between two parallel interfaces (compatible with Data products parallel interface standard); four asynchronous EIA-232 serial data communication channels; and a single 802.3/Ethernet Local Area Network (LAN).

One serial port is available with the full functionality associated with the existing DECserver 200/MC product for EIA-232 communication, including modem control. All ports offer dedicated 512K character buffer.

The two parallel ports can support line printers operating at speeds up to 2,000 lines/min and are compatible with Digital standard cabling for parallel line printers, such as the BC27A.

The serial ports operate at their full rated speeds of up to 19.2K baud on two ports and up to 9.6K baud on the remaining two ports. Both parallel and serial ports can be accessed at their rated speeds; however, the DECserver 250 overall performance is a factor of CPU and network utilization.

Features

- Host independent; eliminates dedicated CPU/printer connection and provides greater sharing of printers
- Two parallel ports support up to 2,000 lines per minute
- Four serial ports—two at 19.2K baud and two at 9.6K baud
- Simple Ethernet connection
- Customer installable
- Supports LLF01—Long-Line Fiber Optic Interface

Prerequisite Hardware

The DECserver 250 hardware requires both a transceiver drop cable and H4005, DELNI, or DESTA (for ThinWire connection) to connect to the Ethernet physical channel. Additionally, a VAX load host CPU on the same Ethernet as the DECserver 250 is required to enable the downline loading of the software.

Software Support

The DECserver 250 software license is included with the hardware. The software is downline-loaded over the Ethernet LAN from either a DECnet Phase IV, or ULTRIX DECnet load host processor. One active host processor on the same Ethernet as the DECserver 250 is a minimum requirement. Once the DECserver 250 software is loaded, it will communicate with any host processor running the LAT driver. The DECserver 250 software Version 2.0 supports all ports running at their rated speeds:

- Two parallel ports with printers operating at 2,000 lines/min; and
- Three serial ports with printers and one port with a printer or terminal—operating at speeds up to 19.2K baud on two ports and 9.6K baud on two ports.

Prerequisite Software

- VAX VMS operating system, V4.7 or later
- DECnet-VAX, V4.7 or later
- ULTRIX V3.0–V4.0
- DECserver 250, VMS or ULTRIX, V2.0 (license included with the hardware). Media and documentation must be ordered separately.

DECserver 250 *(Continued)*
Optional Software

Terminal Server Manager, a component of the DECmcc Site and Enterprise Management stations, is a software tool that allows a VAX host to remotely observe and control Digital terminals anywhere in an extended local area network. (Refer to SPDs 31.87 and 31.88.)

Ordering Information

DSRVP-AA/AB	DECserver 250, with license, 120 V/240 V

Country Kits

Country kit must be ordered with 240-V models; no charge for these kits.

DSRVP-KB	Switzerland (French and German)
DSRVP-KD	Denmark
DSRVP-KE	United Kingdom
DSRVP-KG	Germany/Austria
DSRVP-KI	Italy
DSRVP-KJ	Japan
DSRVP-KT	Israel
DSRVP-KZ	Australia/New Zealand
DSRVP-LA	Belgium, Finland, Holland, Norway, Sweden, France, Spain

Media and Documentation (Required)

QA-VTMAA-HM	DECserver 250 VMS (magtape) and documentation kit
QA-VTMAA-H5	DECserver 250 VMS (TK50) and documentation kit
QA-VTNAA-HM	DECserver 250 ULTRIX media (magtape) and documentation kit
QA-VTNAA-H5	DECserver 250 ULTRIX media (TK50) and documentation kit

Note: For more information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

MUXserver 300/310/380/DECmux 300 Remote Terminal Server Communications Servers

MUXserver 320/380 and DECmux 300 Remote Terminal Servers connect remote asynchronous terminals, serial printers, modems, and non-LAT hosts to an 802.3/Ethernet local area network. Phone costs are minimized by concentrating data from multiple users at one site over a pair of modems and one leased phone line.

The MUXserver 320/380 connects to the LAN and functions as a terminal server for remote devices. The DECmux 300 connects devices at the remote site and functions with the MUXserver as a statistical multiplexer. Users can access both LAT services and Telnet services (e.g., UNIX hosts) that are available on the Ethernet LAN.

The MUXserver 320 connects up to 32 remote users from up to two remote sites. One phone link runs at a maximum speed of 64 Kb/s and the other phone link runs at a maximum speed of 19.2 Kb/s, although the total aggregate bandwidth cannot exceed 64 Kb/s.

The MUXserver 380 connects up to 128 remote users from up to eight remote sites. Two phone links run at a maximum speed of 64 Kb/s and six phone links run at a maximum speed of 19.2 Kb/s, although the total aggregate bandwidth cannot exceed 128 Kb/s.

Both the MUXserver 320 and 380 can communicate to any DECmux 300 model. Up to three DECmux 300s can be daisychained from any MUXserver link, with a maximum of six DECmux 300s through the MUXserver 320 and 16 DECmux 300s through the MUXserver 380.

DECmux 300s with EIA-232-D user ports have full modem control to support dialup modems as well as asynchronous connections to non-LAT hosts. Models with EIA-423-A user ports provide open DECconnect wiring for terminals and printers.

MUXserver 300/310/380/ DECmux 300 *(Continued)*

Prerequisite Hardware

- One MUXserver with the appropriate number of DECmux 300s plus user port cables.
- One 3002 or equivalent leased phone line and one pair of external modems and cables, where needed.
- All 802.3/Ethernet physical channel hardware.
- An 802.3/Ethernet transceiver, DESTA, or DELNI and transceiver drop cable.

Prerequisite Software

MUXserver software must be downline-loaded to a MUXserver or unit from either a VMS or ULTRIX host. The MUXserver is supported by Terminal Server Manager (TSM) software.

The MUXserver 320 and 380 are shipped with a software license. 120-V devices include a country kit (U.S. power cord). Each 240-V MUXserver or DECmux requires a country kit from the list below.

Ordering Information

DSRZE-AA/AB	MUXserver 320, 120 V/240 V
DSRZD-AA/AB	MUXserver 380, 120 V/240 V
DM308-AA/AB	DECmux 300, 8-channel EIA-232-D, 120 V/240 V
DM316-AA/AB	DECmux 300, 16-channel EIA-232-D, 120 V/240 V
DM316-BA/BB	DECmux 300, 16-channel EIA-423-A, 120 V/240 V; requires two H3104-B kits
DM332-BA/BB	DECmux 300, 32-channel EIA-423-A, 120 V/240 V; requires four H3104-B kits
H3104-B	Cable kit; two required for DM316-Bx, four required for DM332-Bx
CK-DM308-A7	8-channel EIA-232-D upgrade kit for DM308-Ax and DM316-Bx
CK-DM316-W7	16-channel EIA-423-A upgrade kit for DM308-Ax and DM316-Bx; order two H3104-B kits separately
QA-VT7AA-Hx	MUXserver 320/380 media and documentation for VMS
QA-VZHAA-Hx	MUXserver 320/380 media and documentation for ULTRIX

x denotes media type: 5 = TK50, M = magtape

Country Kits

DM300-KZ	Australia, New Zealand
DM300-MA	Belgium, Finland, France, Holland, Norway, Spain, Sweden
DM300-KD	Denmark
DM300-KG	Germany
DM300-LJ	India
DM300-KT	Israel
DM300-KI	Italy
DM300-KJ	Japan
DM300-MB	Switzerland
DM300-KE	United Kingdom

Note: Refer to the *Networks Buyer's Guide* for additional information. For more information, call the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

DEC Commserver 100/150 Communications Servers

The DEC Commserver 100/150 family of Ethernet servers enables VAX VMS computers to communicate with a wide variety of industry-specific synchronous serial line protocols. With a capacity of 40 serial lines at 9.6K baud in the DEC Commserver 150 (up to 80 lines at lower speeds), these servers can also allow a computer to handle a larger number of serial lines than computer backplane options will support.

Using the widely accepted line cards and protocols mode by Simpact Associates, the DEC Commserver provides the ability for Digital VAX VMS systems to connect to market data feeds such as Telerate International Quotations (TIQ), Standard and Poor's Ticker's III and IV, and Reuter's Integrated Data Network (IDN) as well as Financial Systems such as S.W.I.F.T. and CHIPS and market broadcasts from SIAC, NYSE, NASD. Military and government agencies can connect to AUTODIN, ADCCP NRM and ADCCP ABM. Those with special protocol requirements can create point-to-point links to other systems using HDLC, X.25, DDCMP, 3270, and 2780/3780 protocols.

Features

- Single host handles larger number of lines than its backplane can accommodate
- Serial lines accessible to any other VAX VMS system in the network, either as backup or for alternate tasks
- Provides universal interface to serial lines, regardless of internal bus structure of the host VAX
- Physical location of the facility's serial lines are independent of the client computer's location
- CPU performance is increased by off-loading line handling from the host
- Existing host-resident Q-Bus Simpact cards can be moved to a DEC Commserver with no application software changes

Prerequisite Hardware

DEC Commserver requires a transceiver drop cable and H4005, DELNI, or DESTA (for ThinWire) for connection to the Ethernet physical channel—VAX load host with DECnet on the same Ethernet as the DEC Commserver is required to downline load the software.

Prerequisite Software

- VMS operating system , V5.4 or later
- DECnet on the load host (not on the DEC Commserver's client node or nodes, if different)

Step 1—Line Cards

Select line cards. Separate lines by protocol (one protocol per line card), use the following table to select quantity and types of modules for each protocol. **Note:** DSPAX-AA, contains the protocol processor and four serial ports (order DSPAX-BA for European PTT certification). For line speeds below 19.2K baud, DSPAX-CA expander module is used (for EIA-232/V.28 only) to add two to 12 additional lines to the 4-line module. Throughput limits of the protocol processor determine how many lines on a 4-line card or 4-line/12-line pair can be used at a given speed. One protocol per DSPAX-AA or DSPAX-AA, DSPAX-CA pair.

DEC Commserver Line Cards Required for Line and Speed

Note: The number refers to quantity required, A refers to DSPAX-AA, C refers to DSPAX-CA.

Line Speed Protocols	2.4 Kb/s	4.8 Kb/s		9.6 Kb/s			19.2 Kb/s		56/64 Kb/s	
	All	AUTODIN	All Others	ADCCP	TELEKURS 3	All Others	TELEKURS 4	All Others	Note 1	Note 2
1	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A
2	1A	1A	1A	1A	2A	1A	2A	1A	2A	1A
3	1A	1A	1A	1A	3A	1A	3A	1A	3A	2A
4	1A	1A	1A	1A	4A	1A	4A	1A	4A	2A
5	1A, 1C	2A	1A, 1C	1A, 1C	5A	1A, 1C	5A	2A	5A	3A
6	1A, 1C	2A	1A, 1C	1A, 1C	6A	1A, 1C	6A	2A	6A	3A
7	1A, 1C	2A	1A, 1C	2A	7A	1A, 1C	7A	2A	7A 4A	
8	1A, 1C	2A	1A, 1C	2A	8A	1A, 1C	8A	2A	8A	4A
9–10	1A, 1C	3A	1A, 1C	2A, 1C		2A, 1C		3A		5A
11–12	1A, 1C	3A	1A, 1C	3A		2A, 1C		3A		6A
13–14	1A, 1C	4A	2A, 1C	3A, 1C		2A, 2C		4A		7A
15–16	1A, 1C	4A	2A, 1C	4A		2A, 2C		4A		8A
17–18	2A, 1C	5A	2A, 2C	4A, 1C		3A, 2C		5A		
19–20	2A, 1C	5A	2A, 2C	5A		3A, 2C		5A		
21–22	2A, 2C	6A	2A, 2C	5A, 1C		3A, 3C		6A	(Note 1)	(Note 2)
23–24	2A, 2C	6A	2A, 2C	6A		3A, 3C		6A	BSC	X.25
25–26	2A, 2C	7A	3A, 2C	6A, 1C		4A, 3C		7A	FMP	HDLC
27–28	2A, 2C	7A	3A, 2C	7A		4A, 3C		7A	REUTERS	ADCCP
29–30	2A, 2C	8A	3A, 3C	7A, 1C		4A, 4C		8A		ABM
31–32	2A, 2C	8A	3A, 3C	8A		4A, 4C		8A		DDCMP
33–34	3A, 2C		3A, 3C	8A, 1C		5A, 4C				DDN
35–36	3A, 2C		3A, 3C	8A, 2C		5A, 4C				SWIFT&
37–40	3A, 3C		4A, 3C			5A, 5C				CHIPS
41–48	3A, 3C		4A, 4C							
49–52	4A, 3C		5A, 4C							
53–60	4A, 4C		5A, 5C							
61–64	4A, 4C									
65–68	5A, 4C									
69–80	5A, 5C									

Note 1: BSC, FMP, REUTERS (Including Backup)
Note 2: X.25, HDLC, ADCCP ABM, DDN, SWIFT & CHIPS

DSPAX-AA	4-line processor module (use for EIA-232, EIA-449, and V.35)
DSPAX-BA	4-line processor module (use for EIA-232/V.28)
DSPAX-CA	12-line expansion module (EIA-232/V.28 only)

Step 2—I/O Panel Kits

I/O panel kits include universal cables that plug into the line cards and I/O panels that convert the universal cables to the appropriate electrical standard's connectors.

CK-DSPAX-AA	4-line EIA-232 I/O panel kit for DSPAX-AA
CK-DSPAX-AB	2-line EIA-449 (422, 433) I/O panel kit for DSPAX-AA
CK-DSPAX-AC	2-line V.35 I/O panel kit for DSPAX-AA
CK-DSPAX-BA	4-line EIA-232/V.28 I/O panel kit for DSPAX-BA
CK-DSPAX-CA	4-line EIA-232/V.28 I/O panel kit for DSPAX-CA

Step 3—Rackmount Brackets

Each rackmount bracket kit accommodates four I/O panel kits

H3132-AA	5.25-inch rackmount/tabletop bracket

Step 4—Chassis (System Enclosure)

Based on the number of cards selected from Step 1, order DEC Commserver 100 (two available user slots) or DEC Commserver 150 (eight available user slots). Rackmount models include mounting hardware.

DSPAA-AA	Tabletop DEC Commserver 100, 120 or 240 V
DSPAB-BA/BB	Rackmount DEC Commserver 150, 120 V/240 V
DSPAB-CA/CB	Pedestal DEC Commserver 150, 120 V/240 V

Step 5—DEC Commserver License/Media and Documentation

Each client in the network must be licensed to use the DEC Commserver software. A license for the first host is included with the hardware. Order one license for each additional VAX VMS system that will use the DEC Commserver (not required with clusterwide licensing except for alternate load hosts).

QL-GCQA9-AA	DEC Commserver license
QA-GCQAA-Hx	DEC Commserver media and documentation (one required)

Note: x denotes media type, 5 = TK50; M = Magtape

Step 7—Protocol Licenses and Documentation

Select license(s) for the protocol(s) that will be used in each DEC Commserver. Each protocol license allows that protocol to run on one DEC Commserver. A DEC Commserver may run multiple protocols—only one protocol can run on a 4-line card or 4-line/12-line combination at the same time. Protocol media included with DEC Commserver media.

Protocol	License	Documentation
X.25	**QL-GCSAL-2B**	**AA-PE93A-TE**
HDLC LAPB	**QL-GCTAL-2B**	**AA-PE94A-TE**
ADCCP NRM	**QL-GCUAL-2B**	**AA-PE95A-TE**
ADCCP ABM	**QL-GCVAL-2B**	**AA-PE96A-TE**
BSC 2780/3780	**QL-GCXAL-2B**	**AA-PE98A-TE**
BSC 3270	**QL-GCYAL-2B**	**AA-PE99A-TE**
FMP	**QL-GCZAL-2B**	**AA-PE9AA-TE**
AUTODIN	**QL-GD1AL-2B**	**AA-PE9BA-TE**
IDN	**QL-GD2AL-2B**	**AA-PE9CA-TE**
TIC 4	**QL-GD3AL-2B**	**AA-PE9DA-TE**
TIQ	**QL-GD4AL-2B**	**AA-PE9EA-TE**
SWIFT & CHIPS	**QL-GD5AL-2B**	**AA-PE9FA-TE**
DDCMP	**QL-GD6AL-2B**	**AA-PE9GA-TE**

Note: For more information contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.

DEC Multiprotocol Router/Bridge Comparison Chart

Product	Hardware Type	Line Interfaces	Data Links	Routing Support	Bridging Support
DECNIS 600 series	9-slot modular	1 × 802.3 8 × 64K 2 × T1/E1	HDLC X.25	DECnet TCP/IP OSI	IEEE 802.ID/ Spanning tree*
Proteon CNX500	3-slot modular	1 × 802.5 1/2 × 802.3 1 × FDDI 1 × T1/E1	PPP HDLC X.25 FR SDLC	DECnet TCP/IP IPX XNS Domain OSI*	Spanning tree Source routing SDLC tunneling
DECNIS 500 series	4-slot modular	1 × 802.3 2 × T1/E1 8 × 64K	HDLC X.25	DECnet TCP/IP OSI	IEEE 802.ID/ Spanning tree*
Proteon p4100+	4-slot modular	1 × 802.3 1 × 802.5 1 × T1/E1	PPP HDLC X.25 FR SDLC	DECnet TCP/IP IPX XNS Domain OSI*	IEEE 802.ID/ Source routing SDLC tunneling
DEC WANrouter 500	Bounded	1 × 802.3 4 × 64K OR 3 × 256K	DDCMP HDLC X.25 FR	DECnet TCP/IP OSI	N/A
DEC WANrouter 250	Bounded	1 × 802.3 8 × 19.2K OR 2 × 64K	DDCMP HDLC X.25*	DECnet TCP/IP OSI	N/A

Note: features marked * will be available in a subsequent release.

Requirement	Solution
– Token Ring access for PCs	– Proteon p4100+ or CNX500
– High-speed backbone routing	– DECNIS 500 or 600
– Token Ring to FDDI	– Proteon CNX500
– Low speed access routing over 64 Kbits/s synchronous connections	– DEC WANrouter 250 or 500
– Expansion capability	– DECNIS 600
– "Future-safe" for higher speed services	– DECNIS 600

DECNIS 600

The DEC Network Integration Server 600 (DECNIS 600) integrates local and wide area networks. It acts as a high-speed multiprotocol router, remote and local bridge, and X.25 gateway server that fans in traffic from remote sites to high-bandwidth backbone networks.

Its modular design allows the customer to mix and match network interfaces. Up to seven module slots are available for multiple LAN and WAN network interface cards. As new network technologies are required, new network interface cards can be purchased.

The DECNIS 600 is expandable, allowing new network interface cards to be added as required. Live insertion allows these interfaces to be added without powering down the unit, ensuring no disruption of service to network users.

The server's hardware design is based on a distributed processing architecture, with packet forwarding performed on the network interface modules. This means that the overall packet throughput increases as network interfaces are added.

Features

- DECNIS Routing Services—The DECNIS 600 provides a network routing service for:
  - ADVANTAGE-NETWORKS nodes
  - DECnet Phase IV nodes
  - TCP/IP hosts
  - OSI-compatible end systems
- DECNIS Bridging Services—The DECNIS 600 provides a bridging service for:
  - Any LAN traffic that cannot be routed, such as LAT or other protocols
  - Nodes attached to IEEE 802.3/Ethernet LANs connected to different DEC LANcontroller 601 interfaces on the DECNIS 600
  - Nodes accessible through any IEEE 802.ID-compliant bridge connected on the same LAN as the DECNIS 600 and participating in the same spanning tree topology (for example the LANbridge 150 or LANbridge 200).
  - Nodes locally accessible to another DECNIS 600 unit which is connected remotely to the DECNIS 600 using the DEC WANcontroller 622 network interface card.

  When providing a remote bridging service, the following restrictions apply:
  - Remote bridging is not supported at speeds less than 56 Kb/s
  - Remote bridging is not supported on the DEC WANcontroller 618 network interface card
  - It is not recommended that multiple remote bridging hops be configured between DECNIS 600 units. (The remote bridging path should not pass through more than one consecutive synchronous link.)
- DECNIS X.25 Services—The DECNIS 600 provides X.25 Gateway services that relay X.25 Level 3 packets to and from:
  - Digital and multivendor systems on the LAN
  - X.25 Data Terminal Equipment (DTE) connected over an X.25 Packet Switched Data Network (PSDN)
  - X.25 Data Terminal Equipment (DTE) connected directly to the unit
  - Any of the above connected to another Digital X.25 Gateway service accessible over a routing network

  These end systems can be collocated on the same LAN as the router or connected to the synchronous ports of the router. Connections to other routers or end systems can be made
  - Locally over the LAN using IEEE 802.3/Ethernet
  - Remotely using modem connections over leased lines using the HDLC data link protocol
  - Remotely across a PSDN using X.25 protocols

DECNIS 600 Preconfigured Systems

Preconfigured systems include management processor and memory cards, and two network interface cards. Additional network interface cards may be ordered separately.

- DECNIS 600-EP—This is the standard base package for high-speed routing and bridging. The DECNIS 600-EP preconfigured system includes a DEC LANcontroller 601, a DEC WANcontroller 622, and routing and bridging software licenses.
- DECNIS 600-RP—This is the standard base package for low-speed routing. The DECNIS 600-RP preconfigured system includes a DEC LANcontroller 601, a DEC WANcontroller 618, and a routing software license.

DECNIS Network Interface Cards

- DEC WANcontroller 618—Supports eight synchronous lines for routing at speeds from 1.2 Kb/s up to 64 Kb/s. EIA-232, V.35, and EIA-422/V.11 models are available. Remote bridging is not supported on this card.
- DEC WANcontroller 622—Supports two synchronous lines for remote bridging and routing at speeds from 56/64 Kb/s up to 2.048 Mb/s. Models that support V.35, EIA-422/V.11, and X.21 Leased Line/BT Kilostream are available.
- DEC LANcontroller 601—A single-port IEEE 802.3/Ethernet interface card with a standard Ethernet 15-pin AUI interface supporting routing and local bridging.

Prerequisites

Hardware: VAX, MicroVAX, VAXstation, VAXserver, DECstation or DECsystem computer for software installation and load host.

Software

- VMS load host
  - VMS operating system V5.4
  - DECnet VAX V5.4 including extensions kit
- ULTRIX load host
  - VAX ULTRIX or RISC ULTRIX operating system V4.2
  - DECnet OSI for ULTRIX V5.0

Note: DECNIS software is downline-loadable from the VMS for VAX, VAX ULTRIX, or RISC ULTRIX host systems over IEEE 802.3/Ethernet and synchronous links.

Ordering Information

DECNIS 600 Preconfigured Systems

The DECNIS 600-EP includes a nine-slot DECNIS enclosure (120-V/240-V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 601, DEC WANcontroller 622, and routing and bridging software licenses. Three interface options are available:

DNSEA-BC/BD*	DECNIS 600-EP preconfigured system with X.21 LL interface
DNSEB-BC/BD*	DECNIS 600-EP preconfigured system with V.35 interface
DNSEC-BC/BD*	DECNIS 600-EP preconfigured system with EIA-422 interface

The DECNIS 600-RP includes a nine-slot DECNIS enclosure (120-V/240-V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 601, DEC WANcontroller 618, and a routing software licenses. Three interface options are available:

DNSED-BC/BD*	DECNIS 600-RP preconfigured system with V.35 interface
DNSEE-BC/BD*	DECNIS 600-RP preconfigured system with EIA-422 interface
DNSEF-BC/BD*	DECNIS 600-RP preconfigured system with EIA-232 interface

* BD version includes U.S. power cord; BC version requires appropriate country kit.

Country Kits

DNSXC-A*	DECNIS country kit

Note: Replace the * with one of the following codes: **A** (United States and Canada), **D** (Denmark), E (United Kingdom and Ireland), **I** (Italy), **K** (Switzerland), **T** (Israel), **X** (Central Europe), **Z** (Australia, New Zealand).

Network Interface Cards

DNSAE-AA	DEC LANcontroller 601 1 port IEEE 802.3
DNSCA-AB	DEC WANcontroller 618 V.35 package
DNSCA-AC	DEC WANcontroller 618 422/V.11 package
DNSCA-AD	DEC WANcontroller 618 EIA-232 package
DNSCB-AA	DEC WANcontroller 622 X.21LL/KS package
DNSCB-AB	DEC WANcontroller 622 V.35 package
DNSCB-AC	DEC WANcontroller 622 422/V.11 package

Software Licenses and Media

QL-GX7A9-AA	DECNIS Router license
QL-GZNA9-AA	DECNIS Bridge license
QA-GX7AA-H*	DECNIS software media and documentation (VMS load host)
QA-GX7AB-H*	DECNIS software media and documentation (VAX ULTRIX load host)
QA-GX7AC-H*	DECNIS software media and documentation (RISC ULTRIX load host)

*H = TK50, M = 9MT16 magtape

Refer to Software Product Description 36.05.00 and System Support Addendum 36.05.00-A for further information.

DECNIS 600 Specifications

Physical Characteristics

Height:	55.4 cm (21.82 in.)
Width:	48.2 cm (19 in.)
Depth:	47.2 cm (18.61 in.)
Weight:	Base unit*: 33 kg (72 lb) Network interface cards: 1 kg (2.2 lb) Fully loaded unit: 40 kg (88 lb) maximum

* Base unit includes: enclosure, power supply, fan tray, processor, and memory modules

Power Requirements

Nominal:	100 Vrms to 120 Vrms (120 V) 200 Vrms to 240 Vrms (240 V)
Range:	50 Hz to 60 Hz
Consumption:	600 W (maximum)

DECNIS 500

The DEC Network Integration Server 500 (DECNIS 500) is a smaller version of the DECNIS 600. It acts as a high-speed multiprotocol router and bridge that provides high-bandwidth connections into backbone networks for remote sites.

The DECNIS 500 uses the same modular design and architecture as the larger DECNIS 600, and provides two module slots for LAN and/or WAN network interface cards. These cards are identical to and interchangeable with the DECNIS 600. The DECNIS 500 is packaged as a fully-populated preconfigured system (i.e., no expansion slots available).

DECNIS 500 Preconfigured Systems

- DECNIS 500-EP—This is the entry level package for high-speed routing and bridging. The DECNIS 500-EP preconfigured system includes a DEC LANcontroller 601, a DEC WANcontroller 622, and routing and bridging software licenses.
- DECNIS 500-R—This is the entry level package for low-speed routing services. The DECNIS 500-RP preconfigured system includes a DEC LANcontroller 601, a DEC WANcontroller 618, and a routing software license.

Features

The DECNIS 500 operates the same software and supports the same network interface cards as the DECNIS 600 product. Refer to the DECNIS 600 entry in this section for supported features, functions and installation prerequisites.

Ordering Information

DECNIS 500 Preconfigured Systems

The DECNIS 500-EP includes a four-slot DECNIS enclosure (120 V/240 V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 601, DEC WANcontroller 622, and routing and bridging software licenses. Three interface options are available:

DNSDA-BC/BD*	DECNIS 500-EP preconfigured system with X.21 LL interface
DNSDB-BC/BD*	DECNIS 500-EP preconfigured system with V.35 interface
DNSDC-BC/BD*	DECNIS 500-EP preconfigured system with EIA-422 interface

The DECNIS 500-RP includes a four-slot DECNIS enclosure (120 V/240 V), 19-inch rackmount kit, management processor and pool memory, DEC LANcontroller 601, DEC WANcontroller 618, and a routing software license. Three interface options are available:

DNSDG-BC/BD*	DECNIS 500-RP preconfigured system with V.35 interface
DNSDH-BC/BD*	DECNIS 500-RP preconfigured system with EIA-422 interface
DNSDI-BC/BD*	DECNIS 500-RP preconfigured system with EIA-232 interface

* BD version includes U.S. power cord; BC version requires appropriate country kit.

Country Kits

DNSXD-A*	DECNIS 500 country kit

Note: *Replace the * with one of the following codes: **A** (United States and Canada), **D** (Denmark), **E** (United Kingdom and Ireland), **I** (Italy), **K** (Switzerland), **T** (Israel), **X** (Central Europe), **Z** (Australia, New Zealand).

Software Licenses and Media

QL-GX7A9-AA	DECNIS Router license
QL-GZNA9-AA	DECNIS Bridge license
QA-GX7AA-H*	DECNIS software media and documentation (VMS load host)
QA-GX7AB-H*	DECNIS software media and documentation (VAX ULTRIX load host)
QA-GX7AC-H*	DECNIS software media and documentation (RISC ULTRIX load host)

*H = TK50, M = 9MT16 magtape Refer to Software Product Description 36.05.00 and System Support Addendum 36.05.00-A for further information.

Specifications

Physical Characteristics

Height:	20.7 cm (8.15 in.)
Width:	48.2 cm (19 in.)
Depth:	35.5 cm (13.97 in.)
Weight:	16 kg (35.2 lb)

Power Requirements

Nominal:	100 Vrms to 120 Vrms (120 V) 200 Vrms to 240 Vrms (240 V)
Range:	50 Hz to 60 Hz
Consumption:	287 W (maximum)

DEC WANrouter 250 Multiprotocol Router

The DEC WANrouter 250 provides a network routing service for:

- ADVANTAGE-NETWORKS nodes
- DECnet Phase IV nodes
- TCP/IP hosts
- OSI compatible end systems

These nodes can be co-located on the same LAN as the router or connected to the asynchronous/synchronous ports of the router. Connections to other routers or end systems can be made:

- Locally over the LAN using IEEE 802.3/Ethernet.
- Remotely using modem connections over leased and telephone lines using either DDCMP or HDLC data link protocols.

Features

The DEC WANrouter 250 is a fully compatible member of an international standards-based multiprotocol router family.

- Accepts downline loadable DEC WANrouter 150/250 software from VAX VMS, VAX ULTRIX, and RISC ULTRIX host systems over IEEE 802.3/Ethernet, or remotely over a synchronous line from host systems or via a DECNIS 500/600.
- Uses local dedicated wiring or remote leased lines using DDCMP and HDLC.
- Supports both synchronous and asynchronous ports.
- Switch selectable ThinWire or thick wire IEEE 802.3/Ethernet connection.

The DEC WANrouter 250 software fully implements Integrated IS-IS to provide:

- OSI routing
- Internet routing
- DECnet routing

Prerequisites

Hardware

- VAX, MicroVAX, DECstation or VAXstation configured as specified in the System Software Addendum 32.97.00-A
- DEC X25gateway 100 (DEMSB-H) as specified in the System Software Addendum 32.97.00-A

Software: Either VMS operating system V5.4 software with DECnet-VAX extensions V5.4 software, or ULTRIX operating system V4.2 running DECnet/OSI for ULTRIX V5.0 software.

Ordering Information

DSRVR-Wx	DECrouter 250 basic hardware, DEC WANrouter 150/250 software license, rack mounting kit, (2) EIA-232-C/D adapter cable, power cable, and hardware documentation. Order media kits separately.

Note: Replace the x with one of the following codes:
A (United States, Canada, Japan, Mexico), **T** (Israel), **Z** (Australia, New Zealand), **D** (Denmark), **E** (United Kingdom, Ireland), **I** (Italy), **K** (Switzerland) **X** (Austria, Belgium, Finland, France, Germany, Netherlands, Portugal, Sweden), **Z** (Australia, New Zealand)

QA-GZZAA-Hx	VMS software media and documentation
QA-GZZAB-Hx	VAX ULTRIX software media and documentation
QA-GZZAC-Hx	RISC ULTRIX software media and documentation
QL-GZ9A9-AA	Migration License for DECrouter 250

Note: x denotes media type: 5 = TK50, M = Magtape
Refer to Software Product Description 36.24 and System Support Addendum 36.24 for further information.

DEC WANrouter 500 Multiprotocol Router

The DEC WANrouter 500 provides a network routing service for:

- ADVANTAGE-NETWORKS nodes
- DECnet Phase IV nodes
- TCP/IP hosts
- OSI compatible end systems

These systems can be colocated on the same LAN as the router or connected to the synchronous ports of the router. Connections to other routers or end systems can be made:

- Locally over the LAN using IEEE 802.3/Ethernet.
- Remotely using modem connections over leased lines using either DDCMP or HDLC data link protocols.
- Remotely across a frame relay network.
- Remotely across a PSDN using X.25 protocols.

Features

The DEC WANrouter 500 is a fully compatible member of an international standards-based multiprotocol router family.

- Accepts downline-loadable DEC WANrouter 100/500 software from the VMS for VAX, VAX, ULTRIX, and RISC/ULTRIX host systems over IEEE 802.3/Ethernet.
- Uses local dedicated wiring or remote leased lines using DDCMP and HDLC, X.25 PSDNs or Frame Relay networks.
- X.25 support is DLM/DA or data link mapping/dynamic assignment. This permits OSI, TCP/IP, or DECnet routing over X.25 networks.

The DEC WANrouter 100/500 software fully implements the following routing standards:

- OSI routing
- Internet routing
- DECnet routing
- X.25 routing circuits
- Frame relay networks

Prerequisites

Hardware

- VAX, MicroVAX, DECstation, DECserver or DECstation as specified in SSA 32-98-00-A.

Software

- Either VMS operating system software with DECnet-VAX network software or the ULTRIX operating system running DECnet/OSI for ULTRIX networking software.
- The DEC WANrouter 100/500 software is provided for installation on any VMS, VAX ULTRIX, or RISC/ULTRIX system with the appropriate version of the operating system and DECnet software. Separate kits must be ordered and installed for use with frame relay networks.

Ordering Information

DEC WANrouter 500 Hardware

DEMSA-Wx DEC MicroServer with DEC WANrouter 100/500 software includes basic hardware (120/240 V), ThinWire Ethernet adapter, 2-m (7-ft) standard Ethernet cable, rack mounting kit, two EIA-232-C/D and two V.35 adapter cables, software license, and hardware documentation

Order number for Germany includes two X.21 adapter cables and two EIA-232-C/D adapter cables.

Note: Replace x with one of the following codes: **A** (United States, Mexico, Canada, Japan), **D** (Denmark), **E** (United Kingdom, Ireland), **G** (Germany), **I** (Italy), **K** (Switzerland), **T** (Israel), **X** (Austria, Belgium, Finland, France, Netherlands, Norway, Sweden, Portugal, Spain), **Z** (Australia, New Zealand).

DEC WANrouter 100/500 Software

Software Media Kits for Leased Line and X.25 Data Links

QA-YT7AA-Hx VMS software
QA-YT7AB-Hx VAX ULTRIX software
QA-YT7AC-Hx RISC/ULTRIX software

Software Media Kits for Frame Relay Data Links

QA-YT7AD-Hx VMS software
QA-YT7AE-Hx VAX ULTRIX software
QA-YT7AF-Hx RISC/ULTRIX software

Note: x denotes media type: 5 = TK50, M = magtape

QL-GZ9A9-AA Migration License for DECrouter 2000

Note: Separate media kits are required for VMS, ULTRIX, and RISC/ULTRIX load hosts. A separate set of media kits is required for the software to operate over frame relay data links.

Refer to the following SPDs for further information on supported processors and services: Software Product Description 32.98.00 and Software Support Addendum 32.98.00-A.

Proteon 4100+ Multiprotocol 802.5/Token Ring Bridging Router

The Proteon 4100+ Bridging Router systems support 4-Mb/s or 16-Mb/s Token Ring and multiprotocol routing and bridging between local and remote networks. These bridging router systems are designed to provide an effective method for integrating 802.5/Token Ring and other LAN technologies in a mixed environment and for supporting the industry protocols listed in the table below.

Features

- 4-Mb/s or 16-Mb/s Token Ring backbone connectivity (UTP and Fiber)
- SNMP network management (manageable via DECmcc SNMP AM V1.1)
- WAN connectivity: 64 Kb/s, T1 (2.048 Mb/s), PDN X.25, DDN X.25 (not PTT approved in Europe)
- 20-MHz 386 CPU, 2-Mbyte RAM, Watchdog timer
- Event logging system and customized event/error reporting
- Wide selection of packaged bridging routers available

4100+ Bridging Router Systems Supported Protocols:

LAN/Backbone	WAN	Network O/S	Bridging	Network Management
802.3/Ethernet	T1/E1	NetWare IPX	Source Routing Bridging (SRB)	SNMP MIB II
802.5 4 Mb/s or 16 Mb/s Token Ring	64 Kb/s X.25	TCP/IP OSI (ES-IS)	Spanning Tree Bridging (ST)	
Apollo Token Ring	Frame Relay SDLC	DECnet Phase IV XNS (3Com, Xerox, UB) AppleTalk Apollo Domain		

Ordering Information

The 4100+ base systems include TCP/IP and source routing and spanning tree bridging as part of the systems software. The 4100+ X.25 base systems add X.25 hardware and software.

The preconfigured 4100+ packaged systems include the base system hardware and software plus DECnet, IPX, and an optional protocol forwarder (XNS, SDLC, Frame Relay, AppleTalk, Apollo Domain, or ES-IS). Optional protocols are included at no extra cost. Preconfigured 4100+ X.25 packaged systems add X.25 software and the X.25 interface hardware (DETAB-AH). Serial line cables must be ordered separately.

The network interface options—Ethernet, Token Ring, T1 or serial lines—are not bundled into the systems and must be ordered separately (with the exception of the 4100+ X.25 systems which include X.25 hardware and software).

4100+ preconfigured packaged systems with SDLC require the T1 serial interface (DETAB-AD) and a serial line cable. These must be ordered separately.

Ordering Information *(Continued)*

4100+ Systems

DETAC-Ax	4100+ base system hardware with system software TCP/IP, source routing and spanning tree bridging

Preconfigured 4100+ packaged systems with base system hardware/software (DETAC-A*) plus additional protocol forwarders:

DETAC-Cx	4100+ packaged system with DECnet IV, IPX, XNS
DETAC-Dx	4100+ packaged system with DECnet IV, IPX, frame relay
DETAC-Ex	4100+ packaged system with DECnet IV, IPX, SDLC
DETAC-Fx	4100+ packaged system with DECnet IV, IPX, OSI (ES-IS)
DETAC-Gx	4100+ packaged system with DECnet IV, IPX, AppleTalk
DETAC-Hx	4100+ packaged system with DECnet IV, IPX, Apollo Domain
DETAC-Jx	4100+ packaged system with DECnet IV and IPX only
DETAC-Kx	4100+ packaged system with DECnet IV only

4100+ X.25 Systems

DETAD-Ax	4100+ base system hardware with system software, X.25, TCP/IP, source routing and spanning tree bridging

Preconfigured 4100+ X.25 packaged systems with base system hardware/software (DETAD-Ax) plus additional protocol forwarders:

DETAD-Cx	4100+ X.25 packaged system with DECnet IV, IPX, XNS
DETAD-Dx	4100+ X.25 packaged system with DECnet IV, IPX, frame relay
DETAD-Ex	4100+ X.25 packaged system with DECnet IV, IPX, SDLC
DETAD-Fx	4100+ X.25 packaged system with DECnet IV, IPX, OSI (ES-IS)
DETAD-Gx	4100+ X.25 packaged system with DECnet IV, IPX, AppleTalk
DETAD-Hx	4100+ X.25 packaged system with DECnet IV, IPX, Apollo Domain
DETAD-Jx	4100+ X.25 packaged system with DECnet IV and IPX Only

Replace x with one of the following codes:
A = United States, **B** = International

4100+ Optional Interface Line Cards and Cables

DETAB-AA	Proteon Apollo Token Ring interface
DETAB-AB	Proteon Ethernet interface
DETAB-AC	Proteon Token Ring adapter
DETAB-AD	Proteon T1 serial interface
DETAB-AH	Proteon X.25 interface
DETAB-AE	Proteon EIA-232 interface and cable
BC07V-1F	HD-26 to EIA-232 interface cable, 45.7 cm (18 in.)
BC07V-1J	HD-26 to EIA-232 interface cable
DETAB-AF	Proteon EIA-449 interface and cable
BC07Y-1F	HD-26 to EIA-449 interface cable, 45.7 cm (18 in.)
BC07Y-1J	HD-26 to EIA-449 interface cable
DETAB-AG	Proteon V.35 Interface and cable
BC07Z-1F	HD-26 to V.35 Interface cable, 45.7 cm (18 in.)
BC07Z-1J	HD-26 to V.35 Interface cable—spare, 50.8 cm (20 in.)
DETAB-AI	Proteon p4100 and rackmount kit

Specifications

Physical Characteristics	
Height	17.7 cm (7.0 in.)
Width	41.3 cm (16.25 in.)
Depth	43.8 cm (17.25 in.)
Weight	21.3 kg (47 lb)
Power Requirements	
Input voltage	90 Vac to 260 Vac
Input frequency	50 Hz to 60 Hz
Power consumption	27 Watts
Operating Environment	
Operating temperature	0° to 50°C (32° to 122° F)
Operating humidity	10% to 95% noncondensing
Connectors	One EIA-232, DB 25 for local console and IEC-320 line cord connector
Power cord	U.S. line cord/Universal Adapter

Proteon CNX 500 Multiprotocol 802.5/Token Ring Bridging Router

The Proteon CNX 500 bridging router is a high-performance, RISC-based bridging router that supports 4-Mb/s or 16-Mb/s Token Ring and FDDI backbone connectivity. The CNX 500 increases network efficiency, manages the overall network performance, and provides network integration for mixed LAN/WAN environments.

Features

- Supports distributed routing over 4-Mb/s, 16-Mb/s or FDDI backbones
- Supports industry-leading protocols
- SNMP network management (manageable via DECmcc SNMP AM V1.1)
- Full range of LAN/WAN support for enterprise-wide connectivity (not PTT approved in Europe)
- Watchdog timer increases network availability
- Event logging system customized event/error reporting

CNX 500 Bridging Router Supported Protocols

LAN/Backbone	WAN	Network O/S	Bridging	Network Management
802.3/Ethernet	T1/E1	NetWare IPX	Source Routing Bridging (SRB)	SNMP MIB II
802.5 4 Mb/s or 16 Mb/s Token Ring	64 Kb/s Frame Relay	TCP/IP OSI (ES-IS)	Spanning Tree Bridging (ST)	
FDDI	SDLC	DECnet Phase IV XNS (3Com, Xerox, UB) AppleTalk Apollo Domain		

Ordering Information

The CNX 500 base systems include TCP/IP and source routing and spanning tree bridging as part of the systems software. CNX 500 X.25 base systems add X.25 software; hardware interface and level converter must be ordered separately.

Preconfigured CNX 500 packaged systems include the base system hardware and software plus DECnet, IPX, and an optional Protocol Forwarder (XNS, SDLC, frame relay, AppleTalk, Apollo Domain, or ES-IS). Optional protocols are included at no extra cost. Preconfigured CNX 500 X.25 packaged systems add X.25 software; hardware interface and level converter must be ordered separately.

The Network Interface options—Ethernet, Token Ring, T1/E1 or serial lines—are not bundled into the systems and must be ordered separately.

CNX 500 systems with SDLC require require the T1/E1 high-speed interface (DETCB-AC) and a choice of level converter.

CNX 500 Systems	
DETCE-AA	CNX 500 base system hardware with system software, TCP/IP, source routing and spanning tree bridging.
	Preconfigured CNX 500 packaged systems with base system hardware/software (DETCE-AA) plus additional protocol forwarders:
DETCE-CA	CNX 500 packaged system with DECnet IV, IPX, XNS
DETCE-DA	CNX 500 packaged system with DECnet IV, IPX, frame relay
DETCE-EA	CNX 500 packaged system with DECnet IV, IPX, SDLC
DETCE-FA	CNX 500 packaged system with DECnet IV, IPX, OSI (ES-IS)
DETCE-GA	CNX 500 packaged system with DECnet IV, IPX, AppleTalk
DETCE-HA	CNX 500 packaged system with DECnet IV, IPX, Apollo Domain
DETCE-JA	CNX 500 packaged system with DECnet IV and IPX only
DETCE-KA	CNX 500 packaged system with DECnet IV only

CNX 500 X.25 Systems	
DETCF-AA	CNX 500 X.25 base system hardware with system software, X.25, TCP/IP, source routing and spanning tree bridging. Preconfigured CNX 500 X.25 packaged systems with base system hardware/software (DETCF-AA) plus additional protocol forwarders:
DETCF-CA	CNX 500 X.25 packaged system with DECnet IV, IPX, XNS
DETCF-DA	CNX 500 X.25 packaged system with DECnet IV, IPX, frame relay
DETCF-EA	CNX 500 X.25 packaged system with DECnet IV, IPX, SDLC
DETCF-FA	CNX 500 X.25 packaged system with DECnet IV, IPX, OSI (ES-IS)
DETCF-GA	CNX 500 X.25 packaged system with DECnet IV, IPX, AppleTalk
DETCF-HA	CNX 500 X.25 packaged system with DECnet IV, IPX, Apollo Domain
DETCF-JA	CNX 500 X.25 packaged system with DECnet IV and IPX only

Note: All CNX 500 systems require TCP/IP TFTP (Trivial File Transfer Protocol) software on a host for downline loading. CNX 500 systems are universal, no country kits or specific geography codes required.

Proteon CNX 500 *(Continued)*

CNX 500 Optional Interface Line Cards and Level Converters

DETCB-AA	CNX 500 Ethernet interface
DETCB-AB	CNX 500 Token Ring adapter
DETCB-AC	CNX 500 dual-port serial T1/E1 interface
DETCB-AE	EIA-232-C level converter
DETCB-AF	EIA-449 level converter
DETCB-AG	V.35 level converter
DETCB-AH	X.21 level converter
DETCB-AL	Dual Ethernet interface
DETCB-AJ	FDDI interface 50 micron
DETCB-AD	FDDI interface 62.5 micron

Specifications

Physical Characteristics	
Height	16.5 cm (6.5 in.)
Width	41.9 cm (16.5 in.)
Depth	41.4 cm (16.3 in.)
Weight	18.1 kg (40 lb)
Power Requirements	
Input voltage	85 Vac to 270 Vac
Input frequency	50 Hz to 60 Hz
Power consumption	240 Watts maximum
Operating Environment	
Operating temperature	15° to 40° C (59° to 104° F)
Operating humidity	5% to 95% noncondensing
Power cord	Universal Adapter

TransPATH 335, 350 Bridge/Routers

The TransPATH Bridge/Router combines a TCP/IP router with a high-speed, protocol-independent bridge in one integrated product. Based on the TransLAN 335 or 350, TransPATH provides all the benefits of a TransLAN bridge while simultaneously routing the TCP/IP protocol. TransPATH keeps TCP/IP broadcasts off the network, saving bandwidth for true user data. This sophisticated hybrid product communicates with existing TransLAN bridges, ensuring true best-path routing in a complex network.

The TransLAN 335 and 350 bridges can be upgraded to routing with the addition of new software. This would minimize the expense to add routing capability when the network grows in complexity. Other routing protocols, such as DECnet, IPX, and XNS can be added in future software releases. The TransLAN bridges can also be managed from DECmcc utilizing the Vitalink Bridge access module.

Features

- Supports the Telnet protocol for managing the network from a UNIX host.
- Implements the Simple Network Management Protocol (SNMP) Management Information Base (MIB) as alternative to Vitalink Management Program.
- Allows traffic filter changes without network downtime.

Ordering Information

DETLB-GA	TransPATH 335, 2 lines, 2.048 Mbits/second each, V.35
DETLB-TT	TransPATH 350, 4 lines, 2 at T1 or multiple lines total 4.096 Mbits/second, UIC
DETLB-TW	TransPATH 350, 4 lines, 2 at T1 or multiple lines total 4.096 Mbits/second, V.35
DETLB-TX	TransPATH 350, 8 lines, 2 at T1 or multiple lines total 4.096 Mbits/second, V.35
DETLX-CA	V.35 modem cable, 7.5 m (25 ft)
DETLX-JA	UIC modem cable, V.35, DTE, 7.5 m (25 ft)
DETLX-JC	UIC modem cable, V.36, EIA-449/422, DTE 3 m (10 ft)

Note: All units are configurable for either 120-V or 240-V operation. One order number includes hardware, software, license, media, and documentation. Cables, DSU/CSU and/or rackmount kit must be ordered separately. Refer to the *Networks Buyer's Guide* for additional information. For more information, call the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

TransLAN III, 320, 335, 350 Remote Bridges

The Vitalink TransLAN bridges offer Digital-supported solutions for long-distance communication needs by allowing users to access services remotely on their 802.3/Ethernet Local Area Networks. TransLAN bridges use high-speed synchronous lines up to 2.048 Mbits/second to connect multiple, geographically dispersed LANs. All traffic from any station on a connected LAN appears as local, including both host-to-host and terminal traffic. The user has simple, direct access to any compatible resource in the extended network. Several bridges can interoperate to combine multivendor 802.3/Ethernet LANs into one integrated, multiprotocol extended LAN.

The TransLAN bridge automatically learns the addresses of network stations, allowing easy installation and automatic reconfiguration when devices are moved or added. It filters locally addressed data frames and forwards only remote traffic. With programmable filter combinations, the TransLAN bridge can provide sophisticated traffic control over the network. The TransLAN bridge can handle a filtering rate up to 14,880 packets/second and a forwarding rate up to 6,800 packets/second (depending on the model).

The TransLAN bridge includes Vitalink Management Program for network planning and diagnostics. This service can be centralized at one site or distributed throughout the network. Capabilities include comprehensive bridge, link and network statistics. The TransLAN bridges can also be managed from DECmcc utilizing the Vitalink Bridge Access Module.

- Provides automatic activation of backup links if the primary link fails.
- Provides enhanced performance support for Digital's terminal servers.
- Supports switched dial-up 56-Kbit/second services for added bandwidth at peak traffic periods, for emergency backup, or for occasional user access. Auto-dial, manual, and time-of-day setup are available.
- Provides for grouping of parallel links for added bandwidth between two sites.
- Provides a consistently high network service level through distributed load sharing, which allows the use of backup paths during operation.

Ordering Information

DETLB-RA	TransLAN 320, 2 lines, 64 Kbits/second each, UIC
DETLB-FA	TransLAN 335, 2 lines, 2.048 Mbits/second each, V.35
DETLB-NW	TransLAN III, 4 lines, 1 @ T1 or multiple lines total 1.024 Mbits/second, V.35
DETLB-PT	TransLAN 350, 4 lines, 3 @ T1 or multiple lines total 4.096 Mbits/second, UIC
DETLB-PW	TransLAN 350, 4 lines, 3 @ T1 or multiple lines total 4.096 Mbits/second, V.35
DETLB-PX	TransLAN 350, 8 lines, 3 @ T1 or multiple lines total 4.096 Mbits/second, V.35
DETLX-CA	V.35 modem cable, 7.5 m (25 ft)
DETLX-JA	UIC modem cable, V.35, DTE, 7.5 m (25 ft)
DETLX-JC	UIC modem cable, V.36, RS449/422, DTE 3 m (10 ft)

Note: All units are configurable for either 120-V or 240-V operation. One order number includes hardware, software, license, media and documentation. Cables, DSU/CSU and/or rackmount kit have to be ordered separately. Refer to *Networks Buyer's Guide* for additional information. For more information, call the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

DEC ISDNrouter 100

The DEC ISDNrouter 100 provides DECnet routing via ISDN Basic Rate Access circuit switching. It supports up to six 64-Kbit-per-second B-channel circuit-switched connections to remote DECnet nodes over ISDN. The product is a dedicated routing system that supports both intra-area (Level 1) and inter-area (Level 2) routing for Phase IV nodes on the LAN, or remote nodes connected through any of the six ISDN B-channels. The ISDNrouter also supports DDCMP point-to-point links and "path splitting."

The DEC ISDNrouter 100 is a packaged ISDN Basic Rate Access router system with hardware and software components. The package includes a software license for VMS, DECnet, and VAX ISDN software. The hardware base for the package consists of a MicroVAX/VAXserver 3300 system (without tape), a VT320 terminal, and a maximum of three DEC ISDNcontroller 100 modules (DIV32).

Features

- Allows DECnet routing on ISDN Basic Rate Access circuits.
- Operates at speeds of 64 Kbits per second for up to six ISDN B-channel connections.
- Single-vendor integrated solution for the new telephony infrastructure (ISDN).

Prerequisites

Any DEC ISDNrouter 100 package specified in the ordering information below and a subscription to an ISDN service requires:

- A VAX system running VMS V5.2-1 or later connected to the same Ethernet LAN as the DEC ISDNrouter 100.
- An appropriate load device available over the network to read the software during installation.

Ordering Information

The entry level DEC ISDNrouter 100 bundled system includes:

- Tapeless VAXserver 3300 (bundled with VMS and DECnet full-function licenses)
- One DEC ISDNcontroller 100
- Loopback connectors
- VAX ISDN software license
- DIV32 installation guide
- DEC ISDNrouter 100 installation guide
- One VT320 and keyboard

DEC ISDNrouter 100 *(Continued)*

See ordering information below for order numbers specifying the number of DEC ISDNcontroller 100 (DIV32) cards desired with the DEC ISDNrouter 100 bundled system.

Note: Order separately at least one copy of the media and documentation kit (QA-VZ9AA-H5 = media and documentation kit, QA-VZ9AA-GZ = documentation only), the ISDN communication cable (BC23T for U.S. and France and BC23U for Germany) and an appropriate power cord (see list included with MicroVAX 3300 menu in Chapter 1, *VAX Systems*).

DISDN-A2/A3	Basic Rate Access router with one DIV32 card
DISDN-B2/B3	Basic Rate Access router with two DIV32 cards
DISDN-C2/C3	Basic Rate Access router with three DIV32 cards

Note: For more information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

StrataCom IPX Transmission Resource Manager

The StrataCom IPX product is a high-performance transmission resource management system that supports the private network environment. It may also be referred to as a T1 multiplexer or nodal processor.

The StrataCom IPX (Integrated Packet Exchange) is an integral component of Digital's wide area and backbone network strategy. With the IPX products providing access to high-speed T1 or E1 communications lines, Digital can design and supply wide area networks capable of integrating voice, data image, and video applications for a variety of industries. The IPX also provides a complementary capability to the DECrouter product family.

The StrataCom IPX employs a leading-edge switching technology called "FastPacket." FastPacket switching instantaneously allocates bandwidth on demand. Information is transmitted in a uniform packet format over a single, high-speed digital trunk line. This enables the IPX to provide reliable, cost-effective and high-performance WAN connectivity for computers, PBXs, and other communications equipment in a corporate backbone network environment. It also implements a complementary technology to FastPacket called "Frame Relay." Frame Relay is an emerging packet-mode service that increases the efficiency of LAN-to-LAN communication via a WAN. It is ideal for "bursty" applications requiring variable amounts of bandwidth.

Features

- FastPacket switching provides adaptive bandwidth allocation at speeds up to 1.544 Mbits/second (U.S. T1) or 2.048 Mbits/second (European E1).
- Reduces T1/E1 nework cost with voice compression at a 4:1 ratio and data compression up to 5:1.
- Integrates voice, data, image, fax, and video; protocol independent.
- Provides 99.99% network uptime with a highly fault-tolerant architecture—no single point of failure.
- Supports a maximum of 960 voice connections, 1200 data connections, and 96 T1/E1 trunk lines.
- Frame relay capabilities for improved performance, low error rates, and minimal network delay.
- Fully supports OSI network management standards.

Ordering Information

A base IPX system unit consists of a cabinet, power supply, and processor card. Additional modules are added, depending on customer-specified functionality and performance requirements, as well as requirements for increased availability from redundant modules.

IPX 12*	22.5 × 17.3 × 19 in. (57.2 × 44 × 48.26 cm). Single-shelf system; tabletop or rackmount. Twelve-card slots, available for trunks and/or voice/data/frame relay ports, two power supply slots (ac), one or two T1/E1 trunks.
IPX 16	60 × 22 × 27 in. (152.4 × 55.8 × 68.6 cm). Single-shelf system; floor-standing cabinet. Sixteen-card slots, fourteen available for trunks and/or voice/data/frame relay ports. Four power supply slots (ac or dc), up to four T1/E1 trunks.
IPX 32	60 × 22 × 27 in. (152.4 × 55.8 × 68.6 cm). Double-shelf system; floor standing cabinet. Thirty-two card slots, thirty available for trunks and/or voice/data/frame relay ports.
IPX HUB	Comprises up to six IPX 16 or 32s, up to 96 T1 trunks. A maximum of 960 voice connections, 1200 data connections.

* Not available in Europe.

System Units	**DIXSA-AD**	IPX 12 DTI-6 PSM, 120 V
	DIXSA-BE	IPX 16, 208 V
	DIXSA-BD	IPX 16, CEPT, 240 V
	DIXSA-BC	IPX 16, 48 Vdc
	DIXSA-CE	IPX 32, 208 V
	DIXSA-CD	IPX 32, CEPT, 240 V
	DIXSA-CC	IPX 32, 48 Vdc
	DIXSA-XA	IPX installation kit type II
	DIXSA-XB	IPX 12 rackmount kit 19 in.
	DIXSA-XC	IPX rackmount kit 23 in.
	DIXSA-XD	IPX OEM equipment cabinet
IPX System Software	All IPX 12, 16, and 32 system units include a system software license	
IPX Application Software	**QL-GKUAX-AA**	IPX 12 DFM license
	QL-GKWAX-AA	IPX 12 FR license
	QL-GKVAX-AA	IPX 16/32 DFM license
	QL-GKXAX-AA	IPX 16/32 FR license
Network Management Software	**QB-GKZAA-TW**	IPX StrataVIEW DOS license, media and documentation
	QB-XK9AA-T5	IPX StrataVIEW PLUS ULTRIX license, media and documentation
Power Supplies	**DIXPA-AA**	IPX 12 600W P/S 120 V
	DIXPA-BE	IPX 16/32 600W P/S 208 V
	DIXPA-BC	IPX 16/32 600W P/S 48 Vdc
IPX Processor Group Module	**DIXCA-CA**	IPX PCC/E card flash EPROM
Digital Trunk Interface Modules	**DIXTA-AC**	IPX NTC/C card
	DIXTA-BA	IPX E1 back card
	DIXTA-BB	IPX T1 back card
	DIXTA-BC	Subrate back card
	DIXTA-CA	IPX TXR/D card
	DIXTA-DA	IPX PIC card
	DIXTA-XA	IPX DT15 utility bus
	DIXTA-XB	IPX DT17 utility bus

FastPacket Voice PAD Modules	**DIXVA-BA**	IPX VCD card
	DIXVA-CA	IPX VDP utility bus
	DIXVA-DA	IPX VDP/A card
	DIXVA-DB	IPX VDP/u card
	DIXVA-EB	IPX CIP/B card
FastPacket Data PAD Modules	**DIXDA-AA**	IPX SDP card
	DIXDA-AB	IPX SDI-EIA-232C back card
	DIXDA-AC	IPX SDI-EIA-232D back card
	DIXDA-AD	IPX SDI-V.35 back card
	DIXDA-AE	IPX SDI-EIA-449 back card
	DIXDA-BD	IPX LDB
	DIXDA-BB	IPX LDI4-EIA-232C back card
	DIXDA-BE	IPX LDI4 DDS back card
	DIXDA-BC	IPX LDI8-EIA-232C back card
	DIXDA-CA	IPX SDP utility bus
Frame Relay PAD Modules	**DIXFA-AA**	IPX FRP card
	DIXFA-BA	IPX V.35 FRP back card
Local Bus	**DIXMA-AA**	IPX local bus, 1 slot
Blank Face Plates	**DIXMA-BA**	IPX front face plate
	DIXMA-CA	IPX back plate, 1 slot
	DIXMA-CE	IPX 16/32 p.s. blanking plate

Ancillary Equipment

Ancillary equipment such as channel banks, echo cancellers, and CSUs are required to complete a T1 network configuration. Consult your Network Site Services representative for third-party recommendations for channel banks and echo cancellers. The Digital DFD03 DSU/CSU should be used to establish the T1 connection.

Note: For more information, contact the EIC Sales Support Hotline at 800-832-6277 or 603-884-8990.

Specifications

Environmental

Temperature: 0°–50° C (32°–92° F)
Relativity humidity: 0% to 95% noncondensing

Electrical (Power Supplies)

A maximum of four power supplies per system
100–130 Vac/50–60 Hz/600 W or
200–250 Vac/50–60 Hz/600 W or,
48 Vdc/600 W

Processors

One or two processor cards
Two EIA-232 network management ports

Voice Ports

Up to 960 voice connections
Integral voice activity detection
Optional ADPCM compression

Data Ports

EIA-232C/D, V.35 and EIA-422/499 interfaces
Up to 1200 data connections
Synchronous data up to 1.334 Mbits/second
Isochronous clocking up to 128 Kbits/second
Optional Data Frame Multiplexing (DFM) up to 64 Kbits/second

Digital Trunk Interfaces

Up to 96 T1/E1 superframe interfaces
Internal or external clock sources at 1.544 MHz or 2.048 MHz ± 10 ppm

DHB32 Asynchronous Controller (VAXBI)

The DHB32 is an asynchronous communications controller for VAXBI systems. The DHB32 enables up to 16 terminals, modems, and serial printers to communicate directly with a VAXBI processor. Supported by both VMS and ULTRIX operating systems, the DHB32 emulates the asynchronous portion of Digital's DMB32 communications controller. Unlike the DMB32, the DHB32 provides no synchronous or parallel printer channel support.

The DHB32 supports aggregate throughput of 16,000 characters per second. Two cabinet kits are available, one providing 16 EIA-232 (modem control) connections and one providing 16 EIA-423 connections with ports 14 and 15 switch-selectable between EIA-423 and EIA-232. This allows for modem connections on these lines. Use of the EIA-423 cabinet kit requires **H3104-B** cable concentrator, one for each eight lines—two total.

Ordering Information

DHB32-M	DHB32 module only
CK-DHB32-AJ	EIA-232 cabinet kit, for use with VAX 6000 series internal and external VAXBI channels, and VAX 9000 VAXBI expansion
CK-DHB32-LJ	DEC-423 cabinet kit, same as above; uses DECconnect MMJ connectors

Configuring Information

Option	Mounting Requirements	Power Requirements					VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V		
DHB32 (EIA-232)	1 VAXBI slot	5.56	0.42	0.42	0.00	0.00	1	8
DHB32 (DEC-423)	1 VAXBI slot	5.56	0.42	0.42	0.00	0.00	1	4

CX Asynchronous Communications Controllers (Q-bus)

The CX communications controllers provide asynchronous communications for Q-bus systems in BA4xx or BA2xx (VAX 4000, Q-bus MicroVAX 3xxx and Q-bus DECsystems) series system enclosures. The controllers operate at speeds to 38.4 Kbits per second per line, and transmit data using either Direct Memory Access (DMA) or programmed output.

The CXY08 provides eight EIA-232-D communications lines to terminals, modems, or serial printers. All lines support full modem control, which permits point-to-point dial-up or leased-time operation. The CXA16 provides 16 EIA-423 (Digital implementation) lines for data-only connections (no modem control) using the DECconnect modular plug connectors. The CXB16 provides 16 EIA-422 communications lines for data-only connections (no modem control).

Ordering Information

CXY08-AA/AF	8-line EIA-232-D asynchronous controller with modem control; factory/field installed
CXA16-AA/AF	16-line EIA-423 (Digital implementation) asynchronous controller (data only); factory/field installed
CXB16-AA/AF	16-line EIA-422 asynchronous controller (data only); factory/field installed

CX Communications Controllers *(Continued)*

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
CXY08-Ax	1	1.64	.40	12.94	3.0	0.5
CXA16-Ax	1	1.60	.20	10.40	3.0	0.5
CXB16-Ax	1	2.00	0.0	10.00	3.0	0.5

Note: For information regarding modules used in systems not listed, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

DEC WANcontroller 220 Synchronous Controller (VAXBI)

The DEC Wide Area Network Controller 220 (DEC WANcontroller 220) is a two-line synchronous communication controller designed specifically for VAXBI systems. It provides host-based connectivity in VAXBI environments for establishing communication with X.25, DECnet, and IBM networks. This is accomplished with Digital's standard layered network software.

The DEC WANcontroller 220 supports DDCMP, HDLC, and SDLC protocols at speeds up to 64 Kbits per second per line for two-line operation, and 192 Kbits per second for one-line operations running HDLC and SDCL protocols. (Actual throughput is application-dependent.)

The two lines of the DEC WANcontroller 220 are independently managed and operated. This permits concurrent communication using Digital's layered network software products (DECnet-VAX, VAX P.S.I., VMS/SNA, DECnet-ULTRIX, and X.25 native mode). Any combination of these software products can share the DEC WANcontroller 220. (VMS/SNA does not support two DSB32 lines.)

Ordering Information

DSB32-M	DEC WANcontroller 220 module only. *Prerequisite software:* WAN device driver kit V1.1 for VMS V5.0 or higher. For VMS systems: VAX Wide Area Network Drivers (SPD 29.64). For ULTRIX systems: DEC Wide Area Network Device Drivers (SPD 32.33).
CK-DSB32-UJ	Cabinet kit for VAX 6000 and VAX 9000 VAXBI expansion for use with shielded cabinets. Includes four 1.5-meter (5-foot) ribbon cables.
CK-DSB32-UN	Cabinet kit for VAX 6000 cabinet expansion for use with shielded cabinets. Includes four 4.6-meter (15-foot) ribbon cables.

External Cables

Adapter and extension cables must be ordered separately based on interface standard requirements.

BC19B-02	EIA-422-A adapter cable
BS19D-02	EIA-232-D adapter cable
BC19E-02	EIA-423-A adapter cable
BC19F-02	V.35 adapter cable
BC55D	Extension cable for BC19B/BC19E
BC22F	Extension cable for BS19D
BC19L	Extension cable for BC19F

Configuring Information

Option	Mounting Requirements	Power Requirements					VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V		
DSB32-M	1 VAXBI slot	4.5	0.08	0.08	0.00	0.00	1	2

DEC ISDNcontroller 100 Synchronous Controller (Q-bus)

DEC ISDNcontroller 100 (DIV32), a single-board, synchronous communication controller, provides Integrated Services Digital Network (ISDN) connectivity for VAX 4000 and Q-bus MicroVAX 3000 series systems. It plugs directly into the MicroVAX BA23, BA123, H9642, and BA2xx/BA4xx series enclosures. The device provides ISDN Basic Rate Access (2B + D) connections to AT&T #5ESS or Northern Telecom DMS-100 central office switches in the U.S. In Europe the product is supported by the French and German public ISDN networks. The DEC ISDNcontroller 100 allows the user to take advantage of many 64 Kbits per second circuits or packet-switching services offered by ISDN.

Each module supports one ISDN Basic Rate Access (BRA) line. A single BRA line consists of two high-performance 64-Kbit-per-second bearer channels or B-channels, and one 16-Kbit-per-second signaling channel or D-channel. The two ISDN B-channels are independently managed and operated to permit different protocols to run concurrently to two separate destinations. The product has 128 Kbytes of onboard memory to downline load level one software, and uses an onboard 68000 microprocessor to control communication functions.

The DEC ISDNcontroller 100 is driven by two ISDN software packages, VAX ISDN and VAX ISDN Access. The VAX ISDN software is loaded onto the MicroVAX host containing the DEC ISDNcontroller 100, which controls the ISDN connection. It allows support for DECnet-VAX and VAX P.S.I layered network software under VMS as well as customer-developed protocols (HDLC, SDLC, DDCMP oriented).

VAX ISDN Access software can be used by any (Q-bus or other) VMS DECnet node, on an Ethernet, for remote access to an ISDN environment.

Features

- Provides high-performance, 64-Kbit-per-second, circuit-switched access to ISDN services via Q-bus VAX systems.
- Allows two protocols to be run simultaneously, one on each channel, to one or two different destinations.
- Reduces communication line cost with traffic-sensitive time-cutting mode.
- Supported on BA2xx/BA4xx, BA23/123 and H9642 MicroVAX enclosures.
- VAX ISDN software manages ISDN call control and customer-application development on host.
- VAX ISDN Access software allows any VMS-based Ethernet node to manage the ISDN connection.

Prerequisite Software

The DEC ISDNcontroller 100 driver software is incorporated into VAX ISDN software version 1.0 for VMS V5.2-1 or higher. Refer to Software Product Descriptions 31.23 and 31.24 for VAX ISDN and VAX ISDN Access software requirements. Order the VAX ISDN Access software only if ISDN communication for Ethernet node is required.

Ordering Information

One DEC ISDNcontroller 100 module must be ordered along with the appropriate cabinet kit. **Note:** DIV32-SA/SF variants do not require cabinet kits.

DIV32-SA/SF	For VAX 4000 and Q-bus MicroVAX 3xxx series systems; factory/field installed
DIV32-M	Q-bus ISDN BRA interface for BA123/BA23/H9642 cabinets
CK-DIV32-MA	Cabinet kit for BA123 enclosure
CK-DIV32-MB	Cabinet kit for BA23 enclosure
CK-DIV32-MF	Cabinet kit for H9642 enclosure

DEC ISDNcontroller 100 *(Continued)*
Cables

Cables must be ordered separately. They provide connectivity between the DIV32 I/O plug and the ISDN wall socket.

BC23T-10	10-foot (3-meter) ISDN BRA cable; ISO 8877
BC23T-25	25-foot (7.6-meter) ISDN BRA cable; ISO 8877

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DIV32	One	5.5	0.00	27.50	3.5	1.0

Note: For more information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

DSV11 Synchronous Controller (Q-bus)

The DSV11 is a two-line synchronous interface that provides up to 256-Kbit-per-second wide area network capability for standalone VAX Q-bus systems. The module supports the DDCMP, HDLC, and SDLC protocols at speeds up to 256 Kbits per second for one-line-only operation, and speeds up to 64 Kbits per second per line for two-line operation. The bisync protocol is also supported at speeds up to 9.6 Kbits per second per line, regardless of whether one or two lines are operating.

For VMS systems, DECnet-VAX, VAX P.S.I., VMS/SNA, VAX 2780/3780 P.E. and VAX 3271 P.E. software products support the DSV11 module. (Refer to the *Networks Buyer's Guide* for more information about these products.) Several combinations of these software products can share the DSV11, with one product controlling both lines, or one product controlling one line while another product controls the second line.

The following table lists the software combinations that can control the DSV11 and the maximum line speeds they support.

Communications Application (speed/line)	Communications application running on the second line (speed/line)				
	DECnet 64 Kb/s[1]	VMS/SNA 64 Kb/s	VAX P.S.I. 64 Kb/s	VAX 2780/3780 P.E 9.6 Kb/s	VAX 3271 P.E 9.6 Kb/s[2]
DECnet-VAX 64 Kb/s	Yes	Yes	Yes	Yes	Yes
VMS/SNA 64 Kb/s	Yes	N/S[3]	Yes	Yes	Yes
VAX P.S.I. 64 Kb/s	Yes	Yes	Yes	Yes	Yes
VAX 2780/3780 P.E. 9.6 Kb/s	Yes	Yes	Yes	Yes	Yes
VAX 3271 P.E. 9.6 Kb/s	Yes	Yes	Yes	Yes	Yes
DECnet-ULTRIX 64 Kb/s	Yes	N/A	N/A	N/A	N/A
X.25 Native Mode 64 Kb/s	Yes	N/A	N/A	N/A	N/A

Notes: [1] Supports 1-line operation at 256 Kb/s if the second line is unused.
[2] 19.2 Kb/s is supported for some configurations. Refer to VAX 3271 P.E. Software Product Description, 25.21.
[3] VMS/SNA does not support two DSV11 lines.

For ULTRIX systems, DECnet-ULTRIX and X.25 native mode support the DSV11 module through the WAN device drivers for ULTRIX.

DSV11 Synchronous Controller
(Continued)
Ordering Information

DSV11-SA/SF	Controller for VAX 4000, Q-bus MicroVAX 3xxx and DECsystem 5500 systems. Includes VMS V5.0 driver software kit with TK50 media, software license, one EIA-232 and one V.35 adapter cable, and documentation. Cabinet kit not required. Factory/field installed.
DSV11-SB/SG	Adapter cable option only. No software or documentation. Cabinet kit not required. Factory/field installed.

Note: For multiple DSV11s on one system, order one DSV11-SA/SF for the first DSV11. Order DSV11-SB/SG for additional DSV11s (maximum five DSV11s per system).

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DSV11-Sx	1 quad slot	5.43	0.69	35.43	3.9	1.0

DEC WANcontroller 620 Synchronous Controller (VAXft)

The DEC Wide Area Network Controller 620 (DEC WANcontroller 620) is a two-line synchronous communication controller designed specifically for VAXft systems. It provides connections for communicating over X.25, DECnet, and IBM networks by using Digital's standard layered network software.

The DEC WANcontroller 620 supports DDCMP, HDLC, SDLC, and BISYNC protocols. Line speeds of up to 64 Kbits/second per line are supported on two lines. Actual line speed is dependent on the application/layered communication product throughput. See SPD of layered product for details.

The two lines of the DEC WANcontroller 620 are independently managed and operated, allowing different protocols to run simultaneously. The controller supports Digital standard layered communication software for DECnet, VAX P.S.I., VMS/SNA, and VAX 2780/3780. Any combination of these software products can share the DEC WANcontroller 620. (VMS/SNA support is limited to one line regardless of hardware interface used.)

Ordering Information

Hardware

For redundantly configured communications—for every two synchronous lines needed, order the following two items:

DSF32-AA	DEC WANcontroller 620, Y-Box, 100-pin cable and terminator (order one).
DSF32-AB	DEC WANcontroller 620, 100-pin cable, 20-pin module interconnect cable (order one).

For non-redundantly configured communications—for every two synchronous lines needed, order the following item. **Note:** This configuration does not provide any fail-over for the communications lines.

DSF32-AA	DEC WANcontroller 620, Y-Box, 100-pin cable and terminator (order one).

Software (Required)

Note: The following software is required. Refer to SPD 29.64 for more information.

QL-VAWA9-AA	VAX WAN device driver kit V1.1B for VMS V5.4-1A or higher.
QA-VAWAA-H5	Software media (TK50) and documentation kit.
QA-VAWAA-HM	Software media (magtape) and documentation kit.

DEC WANcontroller 620 *(Continued)*
External Cables (Required)

Required adapters and extension cables must be ordered separately based on local interface standard requirements.

BC19B-02	EIA-422-A/V.11 adapter cable (0.6 m/2 ft)
BC19D-02	EIA-232-D/V.24 adapter cable (0.6 m/2 ft)
BC19E-02	EIA-423-A/V.10 adapter cable (0.6 m/2 ft)
BC19F-02	V.35 adapter cable (0.6 m/2 ft)
BC55D-xx	Extension cable for BC19B/BC19E
BC22F-xx	Extension cable for BC19D*
BC19L-xx	Extension cable for BC19F

xx = Cable length (feet); 10, 25, 35, etc.

* Maximum supported length is 10.7 m (35 ft) due to EIA-232 standard.

Note: For European installations, maximum length must not exceed 7.6 meters (25 feet) per PTT requirements.

Configuring Information

Option	Mounting Requirements	Power Requirements		
		5 V	12 V	−10 V
DSF32-AA/AB	1 VAXft Slot	7.7 A	0.21 A	0.46 A

DMB32 Multifunction Controller (VAXBI)

The DMB32 is a host-based 8-line multifunction intelligent communications controller that enables a combination of modems and terminals to communicate with Digital's VAXBI processors. The DMB32 operates at speeds up to 38.4 Kbits per second per asynchronous line (under specified conditions) with full modem control. One synchronous line supports message framing, CRC generation, and checking with full modem control of the following protocols: HDLC, SDLC, IBM BISYNC, DDCMP, and GEN BYTE. Parallel printer line supports a wide range of Digital parallel printers. An optional adapter cable is required if the synchronous driver is ordered for use on the DMB32 50-pin D-subminiature connector.

Prerequisite Hardware

Any valid VAXBI system configuration.

Ordering Information

DMB32-M	Includes base module only.
CK-DMB32-LJ	For use with VAX 6000 series internal and external VAXBI channels, and VAX 9000 VAXBI expansion.

Software

For systems running VMS V5.0, the VAX Wide Area Network Device Drivers are required to use the DMB32 synchronous port. For ULTRIX systems, the ULTRIX WAN device drivers are required. License options for system device drivers are as follows. A license is required for each CPU.

QL-VAWA9-AA	VAX WAN Device Driver software license (VMS)
QL-YMKA9-AA	ULTRIX WAN Device Driver software license (ULTRIX)
QA-VAWAA-H5	Media (TK50) and documentation kit (VMS)
QA-YMKAA-H5	Media (TK50) and documentation kit (ULTRIX)
QA-VAWAA-HM	Media (magtape) and documentation kit (VMS)
QA-YMKAA-HM	Media (magtape) and documentation kit (ULTRIX)

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V		
DMB32	1 VAXBI slot	6.75	0.29	0.42	0.0	0.0	1	4

DEC MULTIcontroller 542 Multifunction Controller (DECsystem 5100)

The DEC MULTIcontroller 542 (DSH80) is a two-line synchronous/four-line asynchronous module internal to the system enclosure. It allows for two synchronous connections and four DEC-423 serial data-only lines to enhance communication needs. There is no modem support on the asynchronous lines. The synchronous lines support connections to DECnet/OSI and X.25 networks by using Digital's standard layered network software, and SNA networks by using software developed by Systems Strategies, Inc. The synchronous connections support HDLC and SDLC protocols at speeds up to 64 Kbits/second per line. The asynchronous connections support speeds up to 19.2 Kbits/second. The synchronous operations of the module are supported by the ULTRIX Wide Area Network (WAN) device driver. The DSH80 consists of one controller module, and can be ordered as a factory-installed or field-installed option.

Ordering Information

DSH80-AA/AF	Two-line synchronous/four-line asynchronous connector and four DEC-423 MMJ connectors; second module with one 50-pin D-Sub connector. 100-way internal cable, 50-way internal cable. Factory/field installed.

ULTRIX WAN Device Driver

QL-YMJA8-AA	One-time single-user license for use of synchronous ports.
QA-YMJAA-H5	Media (TK50) and documentation

Software

Order additional software to support X.25 or DECnet/OSI V5.0 connections. SNA software is available from third party.

QL-YSYAN-AA	X.25 native mode license for DECsystem 5100
QA-YSYAA-H5	X.25 native mode media (TK50) and documentation
QL-YT9AN-AA	DECnet/OSI ULTRIX V5.0 license (DECsystem 5100)
QA-YT9AA-H5	DECnet/OSI ULTRIX media (TK50) and documentation

External Cables

The following external cables are required for connection to modems.

BC19B-02	EIA-422-A/V.11
BC19D-02	EIA-232-E/V.24
BC19E-02	EIA-423-A/V.10
BC19F-02	V.35
BC55D-xx	Extension cable for BC19B/19E
BC22F-xx	Extension cable for BC19D; supported length up to 10.7 m (35 ft)
BC19L-xx	Extension cable for BC19F

xx = Cable length (feet); 10, 25, 35, etc.

DEC MULTIcontroller 581/582 Multifunction Controller (MicroVAX 3100)

The DSH32 (DEC MULTIcontroller 581/582) is a dual-function communications controller. It is supported by the VMS and ULTRIX operating systems, DECnet-VAX networking software, VAX P.S.I. communications software, VMS/SNA communications software, and 2780/3780 Protocol Emulator. ULTRIX supports only the eight asynchronous lines.

The synchronous interfaces allow operation at software-set speeds up to 19,200 bits per second when one line is being used (including DDCMP) in non-DMA mode, with full modem control and support for bit- and byte-oriented protocols. The synchronous lines are compatible with Digital's family of modems, Bell 200-series modems, and their equivalents.

DEC MULTIcontroller 581/582
(Continued)

Each variant includes an eight-line standard DEC-423 asynchronous multiplexer which can be set for speeds up to 38,400 bits per second with an operating software limitation of 19,200 bits per second. These lines will support connection of any EIA-423-supported device, but they do not have modem control. 2780/3780 Protocol Emulator is supported on one line only. The DSH32 consists of one controller module, and can be ordered as a factory-installed or field-installed option.

Ordering Information

DSH32-BA	DEC MULTIcontroller 581 for EIA-232/V.24 communications (with BC19V-02 cable and EIA-232 adapter). One synchronous line.
DSH32-BB	Same as above, for EIA-423/V.10 (with BC19W-02 cable).
DSH32-BC	Same as DSH32-BA, for EIA-422/V.36 (with BC19U-02 cable).
DSH32-EA	DEC MULTIcontroller 582 for EIA-232/V.24 communications. For MicroVAX 3100 Model 20e only. Two synchronous lines.
DSH32-EB	Same as above, for EIA-423/V.10 communications.
DSH32-EC	Same as DSH32-EA, for EIA-422/V.36 communications.
DSH32-YA	DEC MULTIcontroller 581 to 582 upgrade; upgrades DSH32-BA to DSH32-EA.
DSH32-YB	Same as above, upgrades DSH32-BB to DSH32-EB.
DSH32-YC	Same as DSH32-YA, upgrades DSH32-BC to DSH32-EC.

The DSH32's synchronous driver software will be shipped as part of the VAX or ULTRIX WAN device drivers. Asynchronous driver software is inherent in VMS and ULTRIX operating systems.

VAX WAN Device Drivers

QL-VAWA9-AA	One-time single-user license, CPU-independent
QA-VAWAA-H5	Media (TK50) and documentation kit
QA-VAWAA-HM	Media magtape and documentation kit

ULTRIX WAN Device Drivers

QL-YMKA9-AA	Software license
QA-YMKAA-H5	Media (TK50) and documentation kit
QA-YMKAA-HM	Media (magtape) and documentation kit

Cables

The following external cables are required for connection to modems.

BC22F-xx	For connecting DSH32-BA/EA to EIA-232-compatible modems.
BC55D-xx	For connecting DSH32-BB/BC/EB/EC to EIA-422/V.36 or EIA-423/V.10-compatible modems.

xx = cable length (feet); refer to *Cables,* at the end of this chapter.

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DSH32-xx	1	0.5	0.3		2.9	0.5

DRB32 Parallel Interface (VAXBI)

The DRB32 is a high-speed (up to 6.7-Mbyte-per-second) asynchronous DMA parallel interface to the VAXBI. The DRB32 uses a 32-bit half-duplex bidirectional I/O path to transfer data to and from the user device and two 8-bit unidirectional paths for control data. A dual register set permits "limitless" data transfers. One version is "subset" compatible with the DR11-W providing a UNIBUS migration path to the VAXBI. Supplied software is generic and may be modified for user applications.

DRB32 Parallel Interface *(Continued)*
Ordering Information

Hardware

DRB32-M	VAXBI parallel interface; connects to user device within the same cabinet system as the VAXBI system.
DRB32-W	Module with subset of DR11-W functionality plus DRB32-M; connects to user device within the same cabinet system as the VAXBI system.
DRB32-E	Longline module plus DRB32-M; connects to user device or another DRB32-E up to 12 meters (40 feet) outside the system cabinet; a BS17Y external cable must be ordered separately.

DRB32s include base option module(s) only and require following cabinet kit.

CK-DRB32-LJ	Cabinet kit with 5-foot (1.5-meter) cables for VAX 6000 series system cabinets, VAX 9000 VAXBI expansion cabinets, and for H9657 VAXBI expansion cabinets.

Software

DRB32 VMS software is included in one package. Customers need to purchase the package only once in order to modify the code to support their unique devices. No other software or licenses are required.

QB-VF5A9-Yx	VMS V5.0 drivers and sources for DRB32-M/-E and DRB32-W and AA-HX25C-TE manual (CPU cross product).

x denotes media type: 5 = TK50; M = magtape

Documentation

The VAXELN V3.1 (or later) toolkit includes DRB32-M/E and DRB32-W drivers. The DRB32 is also supported by VAX Realtime Accelerator (VAX RTA) products.

EK-DRB32-OV	*Introduction to the DRB32 Adapter*; ordered separately. Provides enough information for a make/buy decision.
EK-DRB32-TM	*DRB32 Technical Manual*; ordered separately. Hardware specifications.
EK-DRB32-IN	*DRB32 Installation Guide*; ordered separately.
AA-HZ25C-TE	*DRB32 Programmer's Reference Manual*; ships with VMS drivers, ordered separately. Software specifications.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V		
DRB32-M	1 VAXBI slot	8.0	0.0	0.0	0.0	0.0	1	N/A
DRB32-E	2 VAXBI slots	9.8	0.0	0.0	0.0	0.0	1	2
DRB32-W	2 VAXBI slots	11.8	0.0	0.0	0.0	0.0	1	N/A

Note: The DRB32-M and DRB32-W must be installed with the user's device in the same Digital-approved cabinet system. The DRB32-E is used to drive signals external from the cabinet. Total cable length must be less than 50 feet (15 meters).

The number of DRB32s that can be put into a system depends on the system configuration and the planned application. For VAX 6000 series systems and VAX 9000 VAXBI expansion, two DRB32s are supported on each VAXBI; up to eight DRB32-Ms, DRB32-Es, or DRB32-Ws can be configured.

Many customers need to design interfaces that adapt their unique devices to the DRB32. If these interfaces plug into the VAXBI backplane next to the DRB32, the customer should obtain a VAXBI license and the VAXBI technology tools that will ensure a design with mechanical and electrical integrity.

DRB32 Parallel Interface *(Continued)*
BS17Y Cable

The BS17Y is a set of three fully shielded cables designed for use with the DRB32-E. Each cable in the set has 25 controlled impedance twisted pairs.

Specifications

- Conductors: 50 (25 twisted-pair) 50-position, molded, D-subminiature male connector on each end
- Gauge-conductors: 28-AWG-stranded
- Shield: Foil with braid
- Wiring: Point-to-point

Ordering Information

BS17Y-20	External cable for DRB32-E—20 feet (6 meters)
BS17Y-40	External cable for DRB32-E—40 feet (12 meters)

DRQ3B Parallel Interface (Q-bus)

The DRQ3B is a high-performance Q-bus parallel I/O interface designed for realtime data collection or for high-speed interprocessor communications between Q-bus systems. With its two independent 16-bit parallel channels, the DRQ3B can receive or send data or do both concurrently at up to 1.2 Megawords per second total throughput (2.4 Mbytes per second) in extended block mode. Its double buffering capability allows the DRQ3B to transfer data continuously up to this maximum rate. To enhance its realtime performance, the DRQ3B provides a 512-word FIFO buffer on each channel. The DRQ3B supports program-controlled transfers and single-cycle, burst-mode, and block-mode DMA (direct memory access) transfers. These features make the DRQ3B perfect for demanding I/O applications such as data telemetry, simulation, structural and performance testing, seismic data collection, and high-speed graphics display and imaging.

Ordering Information

Hardware

DRQ3B-SA/SF	High-speed 16-bit parallel DMA interface with documentation. Factory installed in VAX 4000 Model 300 and Q-bus MicroVAX 3000 series systems. Processing constraints may preclude option usage on workstations except when workstations are lightly loaded. Cabinet kit not required. Software driver must be ordered separately. Factory/field installed.

Cables

BC19T-xx	Cable for connecting the DRQ3B to a user device or to another DRQ3B. Two BC19T cables must be ordered for each DRQ3B module. Both 25- and 50-foot lengths available (equivalent to 7.6 m and 15 m).

Software

QA-0APAA-H5	MicroVAX/DRQ3B device driver binaries and documentation on TK50 media (license must be ordered separately).
QA-0APAA-GZ	MicroVAX/DRQ3B device driver documentation.
QL-0APAx-AA	MicroVAX/DRQ3B single-use binaries, paid-up license without warranty. x = processor code

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DRQ3B-Sx	1 quad slot	4.5	0.0	22.5	2.0	0.5

Note: For more information contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

DRV1J Parallel Interface (Q-bus)

The DRV1J is a parallel line interface with four programmable ports, each containing 16 I/O lines. It will also accept up to 16 external interrupt requests, a capability that makes it useful for realtime response in sensor I/O applications.

Features

- Four 3-state, 16-bit parallel I/O ports.
- User-assigned device addresses.
- Accepts up to 16 external interrupt requests.
- Programmable interrupt vector addresses.
- Program-controlled input/output operations.
- Programmable operating modes:
  - interrupt controller mode: interrupt-driven.
  - priority modes: fixed or rotating.
  - vector address selection: individual or common vector.
- Can drive up to 25 feet (7.6 meters) of shielded cable and 6 feet (1.8 meters) of unshielded flat or round cable.

Ordering Information

DRV1J-SA/SF	64-line parallel interface for VAX 4000 and Q-bus MicroVAX 3000 series systems. Support available in Realtime Test Integrator (RTI). Factory/field installed.
BS04M-12	Cable connecting user devices to the DRV1J-SA/SF.

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
DRV1J-Sx	1	1.80	0.00	9.0	2.0	1.0

Note: For information regarding modules used in systems not listed, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

DRV11 and DRV1W Interfaces (Q-bus)

The DRV11-WA and DRV1W-SA/SF are general-purpose 16-bit parallel direct memory access (DMA) interface modules for Q-bus systems. Each offers 22-bit addressing capability and permits data transfers at rates up to 250K words per second in single cycle mode and up to 400K words in burst mode. Useful for connecting to high-speed user devices or an interprocessor communications link between Q-bus VAX or PDP-11 systems. A device driver is included in VMS V4.4 and later. An ULTRIX driver is also available; see SPD 32.91.

Ordering Information

DRV1W-SA/SF	General-purpose 16-bit parallel DMA Q-22 interface module. Installed in BA4xx or BA2xx series enclosures. Cabinet kit not required. Requires two BC06M-20 or BS06M-21 cables; factory/field installed.
DRV11-WA	General-purpose 16-bit parallel DMA Q-22 interface module for the BA23 or BA123 enclosures. Requires two BC08R (or equivalent) cables to connect to user device. Includes base option module only. Requires one of the following cabinet kits.
CK-DRV1W-KA	Cabinet kit for use with BA23 enclosure; 38-cm (15-inch) cable.
CK-DRV1W-KF	Cabinet kit for use with BA123 enclosure and H9642 cabinet; 91.4-cm (36-inch) cable.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn		I/O Panel Insert Size
		5 V	12 V		ac	dc	
CK-DRV1W-Kx	N/A	N/A	N/A	N/A	N/A	N/A	B
DRV1W-Sx	1 quad slot	1.8	0.0	9.0	2.0	1.0	N/A
DRV11-WA	1 dual slot	1.8	0.0	9.0	2.0	1.0	—

H4005 Transceiver (Ethernet)

The H4005 is a nonintrusive tapping transceiver that provides a physical and electrical connection to a 10-Mbit-per-second IEEE 803.2 "thick" local area network coaxial cable. The H4005 connects to the standard Ethernet coaxial cable via a removable tap assembly. This is the same tap assembly used on the older H4000. This product complies with the IEEE 802.3 specification and can interface to both 802.3 and Ethernet station controllers. The H4005 is a less costly, smaller replacement for the H4000 model. It contains the necessary electronics to send and receive signals at 10 Mbits per second, detect the occurrence of collisions and provide electrical isolation between the coaxial cable and the station. The H4005 is compatible with all products except the DEREP, which requires the H4000.

Ordering Information

H4005-00	IEEE 802.3/Ethernet transceiver.

Customer-installation of H4005 transceiver requires the Ethernet Transceiver Installation Tool Kit (**12-24664-02**). The kit includes all the components necessary to install the H4005.

DELNI (Digital Ethernet Local Network Interconnect)

The DELNI (Digital Ethernet Local Network Interconnect) is a complete Ethernet implementation in a single desktop-sized device. The DELNI can take the place of Ethernet coaxial cable and eight separate Ethernet transceivers. It can be used by itself, or as an economical addition to an existing network. It is customer installable. Systems, communications servers, and bridges—up to eight Ethernet devices—can be connected to the coaxial cable through a single Ethernet transceiver. If there are more than eight systems, connect the first DELNI to eight additional DELNI devices and link 64 Ethernet stations in a single data center. If used in this configuration, the DELNIs cannot be connected to an Ethernet backbone cable.

Ordering Information

The U.S. version of the DELNI does not require a country kit. Each non-U.S. version of the DELNI requires one country kit which contains installation instructions and a power cord. If the country in which the DELNI is to be used is not listed, select a country kit that uses the same plug configuration. Each node connected to a DELNI requires an 802.3/Ethernet communications controller and transceiver cable. (For DELNI-connected configurations, an H4005 transceiver and transceiver cable are needed.)

DELNI-BA	DELNI U.S./Canada
DELNI-BB	DELNI Non-U.S.

Country Kits

DELNK-AZ	Australia
DELNK-AB	Belgium
DELNK-AQ	Canada (English)
DELNK-AC	Canada (French)
DELNK-AD	Denmark
DELNK-AF	Finland
DELNK-AP	France
DELNK-AH	Holland
DELNK-AI	Italy
DELNK-AN	Norway
DELNK-AS	Spain
DELNK-AM	Sweden
DELNK-AL	Switzerland (German)
DELNK-AK	Switzerland (French)
DELNK-AE	United Kingdom
DELNK-AG	Germany

DECrepeater 350 (Ethernet)

The DECrepeater 350 (DEPTR) is a low-cost multiport repeater that connects one backbone Ethernet to eight unshielded twisted-pair distribution ports. It is designed for small configurations where network management is minimal. Its eight ports connect PCs, workstations or other intelligent devices (via standard 8-pin RJ45 jacks) to 802.3/Ethernet 10BaseT unshielded twisted-pair cabling. It also includes a single AUI port for connecting to standard baseband or transceiver cable. Like the DEMPR, it retimes, amplifies, and repeats signals. It must be counted as a repeater for various network configurations. Connectivity to a 10BaseT hub requires home runs to a 10BaseT controller card (DE201) or to a media access device (H3350).

Ordering Information

DETPR-AA/AB	8-port unshielded twisted-pair to Ethernet non-manageable repeater, U.S., 120 V/240 V.
DETPR-BA/BB	8-port unshielded twisted-pair to Ethernet non-manageable repeater (plastic case not included), U.S., 120 V/240 V.
DL-DETPR-AA/AB	Package of 10, 8-port unshielded twisted-pair to Ethernet non-manageable repeaters, U.S., 120 V/240 V.

Power Cords and Documentation

DETPR-DC	Canada
DETPR-DD	Denmark
DETPR-DE	United Kingdom
DETPR-DG	Germany
DETPR-DI	Italy
DETPR-DJ	Japan
DETPR-DK	Switzerland
DETPR-DP	France
DETPR-DT	Israel
DETPR-DX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DETPR-DZ	Australia
DETPR-EE	Ireland

Note: Refer to the *Networks Buyer's Guide* for additional information.

Twisted-Pair Media Access Unit (Ethernet)

The twisted-pair Media Access Unit (H3350) provides 10BaseT connectivity for devices other than PCs. Any device that is equipped with a standard 802.3/Ethernet card can use an H3350 to connect it to a 10BaseT hub, repeater, or network. It functions as a transceiver and complies with the 10BaseT specification. It has an 8-pin RJ45 interface on the 10BaseT side, and an AUI 15-pin connector on the system side. The H3350 has LED indicators for link integrity.

Ordering Information

H3350-AA	Unshielded twisted-pair Media Access Unit—allows for the connection of standard 802.3/Ethernet products to unshielded twisted-pair.

DEMPR Repeater (Ethernet)

The ThinWire Ethernet Multiport Repeater (DEMPR) provides eight ports for connection of eight ThinWire Ethernet segments and one port for a connection to an H4005 transceiver. As a repeater, it extends the length, topology, or interconnection of the physical network medium beyond the limits imposed by a single segment. Each segment can have 29 stations for a total of up to 232 stations.

Ordering Information

DEMPR-AA	120-V ThinWire Ethernet Multiport Repeater. Power cord included.
DEMPR-AB	240-V ThinWire Ethernet Multiport Repeater. Does not include power cord.

Note: Refer to the *Networks Buyer's Guide* for power cord order codes.

DESPR Repeater (Ethernet)

The ThinWire Ethernet Single-Port Repeater (DESPR) connects a single ThinWire segment to a standard Ethernet network. The ThinWire segment can be up to 185 meters (600 feet) long, and can accommodate up to 29 stations.

The DESPR connects to standard Ethernet using an H4005 transceiver, or via a DELNI. When the DESPR/DELNI combination is used, the DELNI must be connected to the standard Ethernet using an H4005 transceiver. The DESPR must be counted as a repeater when configuring a standard Ethernet network.

Ordering Information

DESPR-EE	120-V ThinWire Ethernet Single-Port Repeater. Power cord included.
DESPR-EF	240-V ThinWire Ethernet Single-Port Repeater. Does not include power cord.

Note: Refer to the *Networks Buyer's Guide* for power cord order codes.

DECrepeater 90C/DECrepeater 90T (Ethernet)

The DECrepeater 90C (coaxial) and DECrepeater 90T (unshielded twisted-pair) repeaters provide modular and cost-effective Ethernet connections. The DECrepeater 90T offers 10BaseT networking. The DECrepeater 90C complies with the IEEE 802.3 standard for 10Base2 networks and supports up to 185 meters of ThinWire cabling. Both products are part of Digital's WorkGroup Family of Networking Products.

As standalone units, these repeaters provide a new level of Ethernet connectivity. As part of the DEChub 90 Ethernet backplane, they can be integrated with WorkGroup Family server, bridge, and management modules to increase networking capabilities in seconds. When installed in the DEChub 90, the repeaters can be remotely managed using the DECbridge 90. The DECrepeater 90T and DECrepeater 90C feature:

- Full repeater per port—no retiming module needed in the DEChub 90 backplane
- Automatically identifies and isolates faulty ports.
- High-speed communications—full 10-Mb/s Ethernet throughput.

Ordering Information

DECrepeater 90C country kits contain the DECrepeater 90C Multiport Ethernet Repeater, which is 10Base2 ThinWire compliant. DECrepeater 90T country kits contain the DECrepeater 90T Multiport Ethernet Repeater, which is 10BaseT twisted-pair compliant. The DECrepeater 90C has six BNC ports; the DECrepeater 90T has eight UTP ports.

Ordering Information *(Continued)*

DECrepater 90C/90T for standalone use; includes power supply.

DECrepeater 90C	DECrepeater 90T	Country
DECMR-AA	**DETMR-AA**	U.S., Canada, Japan
DECMR-AD	**DETMR-AD**	Denmark
DECMR-AE	**DETMR-AE**	U.K.
DECMR-AI	**DETMR-AI**	Italy
DECMR-AK	**DETMR-AK**	Switzerland
DECMR-AT	**DETMR-AT**	Israel
DECMR-AX	**DETMR-AX**	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DECMR-AZ	**DETMR-AZ**	Australia
DECMR-BJ	**DETMR-BJ**	India
DECMR-MA	**DETMR-MA**	DECrepeater 90C/90T for use with DEChub 90 (power supply not included)

Note: Multipack country kits (12) are preceded by DL- in the order number.

H7082-AA	120-V power supply with integral power connector
H7082-AB	240-V power supply with IEC connector
H0342-AA	Snap-on cover for hub-based model of the DECrepeater 90T/90C

Configuring Information

Both the DECrepeater 90T and DECrepeater 90C can be configured as standalone units or as part of the DEChub 90. When the DECrepeater 90T/90C is used as a standalone unit, it uses an external power supply. When installed in the DEChub 90 backplane, power is provided by the backplane power supply.

DESTA Station Adapter (Ethernet)

The ThinWire Ethernet Station Adapter (DESTA) connects a standard 15-pin AUI. station to ThinWire cabling. The DESTA can be attached to standard-cable Ethernet controllers allowing UNIBUS, Q-bus, and VAXBI devices to connect to ThinWire Ethernet. It also allows Digital's Ethernet Communications and Terminal Servers to connect to ThinWire Ethernet.

Ordering Information

DESTA-BA	ThinWire Ethernet Station Adapter

ThinWire 802.3/Ethernet

BC16M-06	6-foot (1.8-meter) PVC cable with BNC connectors and boots
BC16M-15	15-foot (4.5-meter) PVC cable with BNC connectors and boots
BC16M-30	30-foot (9-meter) PVC cable with BNC connectors and boots
H8243-A	1,000-foot (305-meter) ThinWire Ethernet PVC cable
H8244-A	1,000-foot (305-meter) ThinWire Ethernet Plenum (Teflon) cable
H8222	Male coaxial connectors and boots
H8223	T-connectors and boots
H8224	Barrel connectors and boots
H8225	Terminators and boots
H8242	Installation kit

DECbridge 90 (Ethernet)

The DECbridge 90 is a high-performance bridge that connects a departmental workgroup to the larger LAN backbone. It keeps local traffic within the workgroup LAN as it forwards traffic that has a destination elsewhere on the backbone. It prevents workgroup traffic from deteriorating overall network performance. As a member of the award-winning WorkGroup Family of Networking Products, the DECbridge 90 can be used in standalone configurations or snapped into the DEChub 90 backplane. It features a ThinWire and AUI connection to the backbone, and a ThinWire-only connection to the workgroup. It simplifies setup and configuration tasks and manages all LAN traffic for up to 200 node addresses.

DECbridge 90 (Ethernet) *Continued)*

- Fully autoconfiguring—automatically configures itself for operation with other LAN Bridge products or any other IEEE 802.1 compliant bridge.
- High-speed communications—filters 29,694 packets/second and forwards 14,847 packets/second, giving workgroups full Ethernet bandwidth.
- Protocol filtering—filters up to 16 protocols in one or in both directions.
- Flexibility—can be used as a standalone bridge or quickly snapped into Digital's DEChub 90 backplane.
- Indicators—power, use, and status LEDs give a continuous display of all key functions.

Ordering Information

DECbridge 90 for standalone use; includes power supply.

DEWGB-AA	U.S., Canada, Japan
DEWGB-AD	Denmark
DEWGB-AE	U.K.
DEWGB-AI	Italy
DEWGB-AK	Switzerland
DEWGB-AT	Israel
DEWGB-AX	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DEWGB-AZ	Australia/New Zealand
DEWGB-BJ	India
DEWGB-MA	DECbridge 90 for use with DEChub 90 (power supply **not** included)

Note: Multipack country kits (12) are preceded by DL- in the order number.

H7827-AA	120/240-V power supply
H0342-AA	Snap-on cover for the hub-based model of the DECbridge 90

Configuring Information

The DECbridge 90 has a ThinWire and AUI conection to the backbone and a ThinWire-only connection to the workgroup. It can be configured as a standalone unit or as part of the DEChub 90 Ethernet backplane. When used as a standalone unit, this product uses an external power supply. When integrated with the DEChub 90 backplane, the DECbridge 90 uses the backplane power supply.

DEChub 90 (Ethernet)

The DEChub 90 provides ThinWire Ethernet connections, power, and mounting for eight plug-compatible WorkGroup Family modules. The hub's revolutionary design promote easy analysis of the hardware status, hot swap module replacement, and flexible network configurations. Its compact size is ideal for office environments. The DEChub 90 can be used to create and manage an Ethernet LAN from one easy-to-manage unit.

When combined with the optional DEHUX enclosure, the DEChub 90 backplane becomes a mini equipment closet. The DEHUX provides mounting for the backplane and patch panels, and provides a cover that limits access to the equipment for added security.

Features

- Provides workgroup communication center in a multifunction hub
- Integrates active components and passive wiring—acts as a hub for active networking components, and a wiring closet for passive wiring.
- Compact—mounts on a wall or in a rack
- Features hot swap module replacement
- Accommodates dense configurations—two DEChub 90 units can be interconnected and managed as a single unit

DEChub 90 *(Continued)*
Ordering Information

DEHUB-BA	DEChub 90, 120 V, rackmount brackets, documentation

Note: The following order numbers include DEChub 90, country-specific power cord, rackmount brackets, and documentation:

DEHUB-BD	Denmark
DEHUB-BE	United Kingdom
DEHUB-BI	Italy
DEHUB-BK	Switzerland
DEHUB-BT	Israel
DEHUB-BZ	Australia
DEHUB-CB	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
DEHUB-CJ	India

DEHUX-AA	Cover assembly, wall-mount brackets, patch panel brackets

Configuring Information

The DEChub 90 backplane accommodates up to eight modules and has an integral power supply. The modules designed for this backplane include the DECserver 90L, DECserver 90L+, and DECserver 90TL terminal servers, DECrepeater 90T and DECrepeater 90C Ethernet repeaters, and the DECbridge 90 network bridge. The DEChub 90 backplane supports up to eight modules and takes up less than one cubic foot of space. Two DEChub 90 units can be interconnected and managed by one DECbridge 90.

DECbridge 5xx/DECbridge 6xx Series (FDDI)

The DECbridge 5xx and 6xx series are standards-compliant LAN interconnect devices that join 10-Mbit/second 802.3/Ethernet LANs to 100-Mbit/second FDDI LANs. Communication between 802.3/Ethernet and FDDI LAN technologies is accomplished through a standards-based translation capability that also accommodates specialized translation for the AppleTalk protocol and Kinetics devices. DECbridge 5xx and 6xx series products support Simple Network Management Protocol (SNMP), enabling a network manager to monitor, configure, and control DECbridge 5xx/6xx series such as protocol-filtering, address learning, settable address filtering, and satistical counters from either Digital or third-party SNMP network management systems. Additionally, DECmcc Extended LAN Manager software provides complete VMS-based network management for these products using Digital's RBMS protocol. The DECbridge 5xx and 6xx series support IP (Internet Protocol) fragmentation. This functionality supports applications that deal with large IP packets, such as imaging.

Compared to the DECbridge 500, the following new functionality is provided in the DECbridge 5xx and 6xx series:

- Dual attachment station (DAS) options, providing direct attachment of DECbridge 52x and 62x products to the FDDI LAN without requiring a concentrator
- Dual homing support, providing fault tolerance in treed topologies (DAS versions)
- External optical bypass device support, allowing network bypass of failed device (DAS multimode versions)
- Single-mode optical fiber FDDI options, allowing up to 40 km between FDDI stations

Features

- DAS or SAS (single attachment station) connection to FDDI—provides configuration flexibility
- SNMP agent—enables management of DECbridge devices in a multivendor network

Comparison Chart—DECbridge 500/600 Series

	DECbridge 5xx Family DECbridge 51x/52x	DECbridge 6xx Family DECbridge 600	 DECbridge 61x/62x
Number of LAN connections			
802.3/Ethernet	1	3	3
FDDI	1	0	1
FDDI connection	SAS/DAS	N/A*	SAS/DAS
Settable filtering	Destination/source address, protocol type		
Learning addresses	14,000	14,000	14,000
LAN interface			
802.3/Ethernet	BNC† and AUI‡	AUI	AUI
FDDI	Multimode/single-mode fiber optics	N/A	Multimode/single-mode fiber optics
Distances between FDDI stations			
Multimode fiber	Up to 2 km	N/A	Up to 2 km
Single-mode fiber	Up to 40 km	N/A	Up to 40 km
SMT version	V6.2	N/A	V6.2
Network management protocol	SNMP/RBMS	SNMP/RBMS	SNMP/RBMS
Network management	DECmcc Extended LAN Manager for VMS, DECmcc Management Station for ULTRIX V1.1, or any SNMP-based network management system		

* Not applicable
† ThinWire connection
‡ Transceiver cable connection to thick wire coaxial cable

Prerequisite Hardware

The SAS-based DECbridge 51x/61x products require the DECconcentrator 500, or an equivalent concentrator from another vendor, for connection to the FDDI network. The DAS-based DECbridge 52x/62x products connect either directly to the dual ring or to a concentrator.

Optional Software

Although no software products are required to operate the DECbridge 51x/52x/600 series, either DECmcc Extended LAN Manager or DECmcc Management Station for ULTRIX or a third-party SNMP network management system may be used to manage, monitor, troubleshoot, and fully utilize the settable characteristics of the devices.

Ordering Information

DECbridge 5xx Series

One FDDI LAN to one 802.3/Ethernet LAN

Note: Order numbers are listed as U.S./non-U.S.

DEFEB-AC/AD	DECbridge 510, SAS, multimode FDDI optics
DEFEB-AS/AT	DECbridge 518, SAS, single-mode FDDI optics
DEFEB-DA/DB	DECbridge 520, DAS, multimode FDDI optics
DEFEB-DM/DN	DECbridge 524, DAS, single-mode FDDI optics Port A, multimode FDDI optics Port B
DEFEB-DP/DQ	DECbridge 526, DAS, multimode FDDI optics Port A, single-mode FDDI optics Port B
DEFEB-DS/DT	DECbridge 528, DAS, single-mode FDDI optics Ports A and B

DECbridge 6xx series

One FDDI LAN to three 802.3/Ethernet LANs

Note: Order numbers are listed as U.S./non-U.S.

DEFEB-NC/ND	DECbridge 600, 3-port 802.3/Ethernet LAN bridge
DEFEB-TA/TB	DECbridge 610, SAS, multimode FDDI optics
DEFEB-TS/TT	DECbridge 618, SAS, single-mode FDDI optics
DEFEB-LA/LB	DECbridge 620, DAS, multimode FDDI optics
DEFEB-LM/LN	DECbridge 624, DAS, single-mode FDDI optics Port A, multimode FDDI optics Port B
DEFEB-LP/LQ	DECbridge 626, DAS, multimode FDDI optics Port A, single-mode FDDI optics Port B
DEFEB-LS/LT	DECbridge 628, DAS, single-mode FDDI optics Ports A and B

U.S. versions include a power cord (BN20A-2E); non-U.S. versions require a power cord.

Notes: The DECbridge 600 is a multiport 802.3/Ethernet bridge; it **does not include** an FDDI interface, but may be easily upgraded when the need for FDDI arises. All other DECbridge 6xx series products **include** an FDDI interface.

Refer to the *Networks Buyer's Guide* for further information.

DECconcentrator 500 (FDDI)

As a backbone interconnect, the DECconcentrator 500 FDDI concentrator, offers two ports to connect to the primary and secondary FDDI rings, and one or two port modules of up to six ports each for connection of devices to the FDDI LAN. As a standalone device, it can be used to create small, dedicated, high-performance FDDI LANs for specialized communities of users. Used in this way, the DECconcentrator 500 can accommodate from one- to three-port modules connecting as may as 18 devices.

Support for "industry-standard" SNMP sets-and-traps allows a network manager to configure, control, and change device parameters in a multivendor environment from any Digital or non-Digital SNMP management station. The DECconcentrator 500 also offers Out-of-Band Management (OBM) through the use of an optional ASCII terminal connected directly to the DECconcentrator 500, providing an alternative path for management access to the device if inband management is blocked or a lower-cost concentrator management solution for small, single concentrator FDDI workgroup configurations. Additionally, Optical Bypass Relay Support is provided, allowing the concentrator to control an external Optical Bypass Relay (OBR). By allowing the datastream to bypass an off-line DECconcentrator, this feature maintains dual ring integrity during local power failures or if a fault condition occurs in the concentrator.

The dual-attachment DECconcentrator 500 provides considerable flexibility for configuring a network in a "dual ring of trees," the predominant FDDI LAN topology. Users can construct hierarchical topologies by attaching one DECconcentrator 500 to another, cascading devices several levels deep.

The DECconcentrator 500 supports both multimode fiber (MMF) and single-mode fiber (SMF), ThinWire and Shielded Twisted Pair (STP), providing cost-effective and flexible connections. Using laser technology, single-mode fiber options support station-to-station FDDI connections of up to 40 kilometers (24.8 miles).

DECconcentrator 5000 (FDDI) *(Continued)*

Comparison of DECconcentrator 500 Media Support

Media	ANSI Optics (DEFCN-N)	Low-Power Optics (DEFCN-L)	ThinWire or STP (DEFCN-S/T)
Distance supported	2 km	1 km	100 m
Maximum number user ports:			
Attached to FDDI dual ring	8	8	12
Standalone configuration	12	12	18

Regardless of the system type, the DECconcentrator 500 provides ANSI Station Management (SMT) facilities. SMT is the data link level capability for station and link configuration and management. It features the following capabilities:

- Ensures interoperability within multivendor networks using standards-compliant FDDI technology
- Permits attachment of FDDI single and dual attachment stations (bridges, systems, workstations, and other concentrators) to the FDDI LAN
- Optimizes topological flexibility by reducing complicated configuration rules and limitations characteristic of a DAS-only FDDI ring
- Modular design provides low-cost entry to the FDDI network
- Provides device insertion and removal through SAS ports, minimizing network disruption and inadvertent ring segmentation

Prerequisites

Hardware: In supporting copper, either ThinWire or STP, the controller and concentrator device must be matched to provide the same interface as the selected physical media. The DECconcentrator (DEFCN-Ax or DEFCN-Bx) requires firmware revision 3.0 or higher to support the 6-port copper option modules. Devices shipped after June 28, 1991, will meet this requirement. For earlier units, a firmware upgrade (QB) kit must be ordered. Refer to the *Networks Buyer's Guide* for further details.

Software: Although no software products are required to manage the DECconcentrator 500, DECmcc management products are recommended to monitor and control capabilities of the DECconcentrator 500. For further information, refer to the *Networks Buyer's Guide.*

Ordering Information

All models include installation instructions. The DECconcentrator 500 is ordered on a component basis. Either box (rack or tabletop) accepts up to three cards, one of which can be a Network Management Card.

DEFCN-AC	FDDI DECconcentrator box with OBM, U.S. power cord, rackmount
DEFCN-BC	FDDI DECconcentrator box with OBM, U.S. power cord, tabletop

Note: Specify "A" for factory installation or "F" for field installation. Field installation requires an additional service charge. Stringent application guidelines apply for the use of single-mode fiber.

Management Modules for FDDI DECconcentrator 500

DEFCN-C	Two ports with A = single-mode and B = multimode
DEFCN-D	Two ports with A = multimode and B = single mode
DEFCN-E	Two ports each with single-mode fiber
DEFCN-MB/MH	Two ports, multimode, with OBR control; factory/field installed

Port Modules for FDDI DECconcentrator 500

DEFCN-F	Four ports with two multimode and two single mode
DEFCN-L	Four ports with low power optics
DEFCN-N	Four ports each with multimode fiber
DEFCN-S	Six ports Shielded Twisted Pair (STP) copper
DEFCN-T	Six ports ThinWire copper

Note: Additional configurations are available for these products. Refer to the *Networks Buyer's Guide* for details.

DF242 Scholar Plus Modem

The DF242-CA Scholar Plus Modem combines high performance with a unique modem access security system. Valuable data is protected by a sophisticated scheme of callback security with password verification. It is a full-duplex modem that communicates asynchronously at speeds of 2400, 1200, and 300 bits/s or 2400 and 1200 bits/s synchronously over dial-up lines. It provides savings in telephone line costs and features speed buffering and the support of two error-correction protocols.

Ordering Information

DF242-CA	2400/1200/300 bits/s FDX Scholar Plus Modem

Specifications

Compatible with	2400 bits/s, CCITT V.22 bis 1200 bits/s, CCITT V.22 Bell 212A 300 bits/s, Bell 103J
Interface compatibility	EIA-232-D, EIA-423
Front panel control switches	Data/Talk (DT), Test Loop (TL), and Power On/Off
Power	Wall-mounted power supply, 120 V, 60 Hz
Size	3 cm high × 15.2 cm wide × 21.8 cm deep (1.19 in. high × 6 in. wide × 8.62 in. deep)
Weight	4.4 kg (2 lb), with power supply
Auto-dialer features	Stores up to 30 telephone numbers (36 characters long) and/or labels in non-volatile memory; phone number linking capabilities (DMCL only); Call Progress Monitoring
Error correction	Microcom Networking Protocol (MNP) Class 2 and 3, or X.PC (TYMNET implementation)
Answer mode security	Access security via password (DMCL only)
Speed buffering	Asynchronous speed buffering from 1200 to 9600 bit/s with optional XON/XOFF or RTS/CTS flow control

Note: For more information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

DECmodem V32

The DECmodem V32 offers both desktop and rackmount options with asynchronous and synchronous modes of operation at speeds of 9600, 4800, 2400, or 1200 bits/s over dial-up or leased lines. A complete security system, greater adaptable speed capabilities and enhanced error correction make the DECmodem perfect for high-performance communications needs. In addition to the Digital Modem Command Language (DMCL), it supports the Hayes AT command set for more experienced users.

HELP screen displays make operating the DECmodem a simple procedure. By selecting a command, the following features may be activated:

- Modem setup parameters can be uniquely defined and stored.
- Remote access option enables Digital Services personnel to examine or change the modem's setup parameters, dial memory, and/or callback memory without an on-site visit.

DECmodem V32 *(Continued)*

- Access security allows only authorized personnel to access the modem parameters list, dial memory and callback memory locations.
- Callback security screens all incoming calls, whether manual or auto-answered before allowing access to the host system.
- Enhanced auto-dialing enables storage of up to 99 telephone numbers, including credit card numbers.
- Self-test diagnostics allow the modem to check its own internal logic when the power is turned on. It is also equipped with remote diagnostic capability.

The rackmount version of the DECmodem V32 is functionally identical to the desktop version yet provides additional benefits. When switching from dial-up connections to leased lines, simply change the front panel of the DECmodem V32 from PSTN (Public Switched Telephone Network) to PLTN (Private Leased Telephone Network) and attach the private line wiring.

It provides dial backup capability which allows the DECmodem V32 rackmount to automatically detect a failure in the leased line connection, switch into dial-up mode, and dial a prestored number on a dial-up line. The rackmount version can be configured to use the dial backup facility through the Digital Modem Command Language (DMCL) and requires no operator intervention.

Ordering Information

DF296-DA	DECmodem V32 Desktop
DF196-DM	DECmodem V32 Rackmount Module

Specifications

Compatible with	9600 and 4800 bits/s, CCITT V32 2400 bits/s, CCITT V.22 bis 1200 bits/s, CCITT V.22 and Bell 212A
Interface compatibility	EIA-232-D
Front panel indicators	Carrier Detect, Send Data, Off Hook, Receive Data, Test Mode (desktop only), Data Terminal Ready, Modem Ready (DF196)
Power	120 V, 60 Hz
Size	7.6 cm high × 15.2 cm wide × 25.4 cm long (3 in. high × 6 in. wide × 10 in. long)
Auto-dialer features	Stores up to 99 numbers (50 characters long) and/or labels in non-volatile memory; phone number linkage (DMCL only); call progress monitoring
Error correction	MNP Class 4 (asynchronous mode only)
Access mode security	Via Passthru
Speed buffering	Asynchronous speed buffering from 1200 to 19,200 bits/s with optional XON/XOFF or RTS/CTS flow control

Note: For more information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

DECtalk Speech Synthesizers (Voice)

Digital's family of DECtalk speech synthesizers can convert ordinary ASCII text into spoken output, can control a telephone line, and can translate and transmit user DTMF input to the host.

Any ASCII computer can communicate with the DECtalk speech synthesizer using ordinary ANSI escape sequences. VMS-based applications can take advantage of the VMS-provided DECtalk programming interface, and the optional DECvoice Software name pronunciation support.

The DECtalk family includes two complementary products that cover many application and system requirements:

- The DECtalk-I DTC01 is a small, self-contained, single telephone line voice synthesizer intended for desktop use. DECtalk-I is ideal for small business applications that require system annunciators, and for interactive terminals and workstations. DECtalk-I includes a local speaker.
- The DECtalk-III DTC03 is a rackmount system that supports from two to eight telephone lines. DECtalk-III is the system of choice for environments that require dial-out audio call-progress detection capabilities, for computer room environments, and for applications that require a large number or a high density of telephone lines.

Call 508-493-0645 for a demonstration of the DECtalk synthesizer.

Features

- With any Touch-Tone telephone, DECtalk and the telephone keypad function as a terminal keyboard to control a host computer and access information.
- Connects to the computer through a standard EIA-232-C serial line.
- Ten voices and unlimited vocabulary.
- User-defined dictionary with acronyms and industry-specific terms.
- Self-contained, onboard diagnostics.
- Sophisticated telephone-handling features.
- Compatible with the DECvoice software name pronunciation support.
- Dial-out audio call progress detection is standard on the DECtalk-III. DECtalk-I supports "blind dialing."

Ordering Information

DTC01-AA	Single-line DECtalk-I text-to-speech unit. One 10-foot (3-meter) BC22D-10 cable is included.
DTC03-AA	Multiple-line DECtalk-III, 8-channel text-to-speech unit. Eight serial cables required.
DTC03-SC	Two-line DECtalk-III, 2-channel text-to-speech unit. Two serial cables required.
DTC03-AM	DECtalk-III board, single-channel DECtalk module. No power supply, enclosure or cabling. Can be an add-on for the DTC03-SC DECtalk-III rack; can also be integrated into custom customer platforms. System designers should also order the documentation kit FB-DTC03.
BC16E-xx*	DECconnect serial cable.
H8575-A	One MMJ adapter is required for each DECtalk-I used in a DECconnect wiring system.
H8571-D	One adapter is required for each DTC03-AM module in a DECtalk-III rack (DTC03-SC or DTC03-AA) when used in a DECconnect wiring system.

* Refer to *Cables,* at the end of this chapter for available lengths.

Ordering Information *(Continued)*

BC22D-xx*	Null modem cable, used for DECtalk-I applications.
BC22E-xx*	Modem cable, one required for each DTC03-AM module installed in a DECtalk-III rack (DTC03-SC or DTC03-AA).
QL-VFUA9-Jx	DECvoice software license for VMS (optional). Supplements the general DECtalk pronunciation rules with support tailored specifically to surname pronunciation. See the DECvoice description in Chapter 4 of this catalog. Requires QA-VFUA9-Hx binaries.
QA-VFUA9-Hx	DECvoice software binaries for VMS. Optional. Requires QL-VFUA9-Jx license.

* Refer to *Cables,* at the end of this chapter for available lengths.

Note: For ordering assistance contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

Configuring Information

Connect DECtalk to a Digital or other computer with a standard EIA-232 compatible line running from the host computer to DECtalk's communication port—DECconnect cabling system recommended. The host system must support full-duplex connections, standard XON/XOFF flow control, and be able to pass the full ASCII character set.

To connect DECtalk to the telephone system, order standard telephone service. For DECtalk-III installations, request RJ21X service (CA21A in Canada). DECtalk-I installations should request RJ11X service (or CA11A in Canada). If RJ21X/CA21A service is unavailable, for information regarding an RJ21X to RJ11 adapter, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

All DECtalk synthesizers are approved for connection to the Public Switched Telephone Network (PSTN) in the United States and in Canada.

Note: For additional cabling information, refer to the *Networks Buyer's Guide,* the *DECdirect* catalog, and the *OPEN DECconnect Building Wiring Components and Applications* catalog.

Cables

Order Number	Length	Description	Where Used
BCC14-10	10 ft (3.05 m)	16-position EIA-232 peripheral cable	
BC06M-20	20 ft (6.1 m)	37-position D-subminiature to 37-position D-subminiature cable	Connects DRV1W-Sx to Q-bus VAX or PDP-11 systems
BC06P-06 **BC06P-09** **BC06P-2F**	6 ft (1.8 m) 9 ft (2.7 m) 2.5 ft (0.8 m)	SCSI cable	VAX 4000, DECsystem 5500, R400X, B400X
BC16D-50 **BC16D-A0**	50 ft (15.24 m) 100 ft (30.5 m)	36-position, right-angle, male-to-male, shielded, 18 twisted-pair extension cable	DECconnect, EIA-423-A Q-bus products
BC16E-02 **BC16E-10** **BC16E-25** **BC16E-50** **BC16E-A0**	2 ft (0.6 m) 10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m)	Six-conductor cable for terminal connection MMP to MMP with crossover pinning	DECconnect standard terminal connection cable
BC16K-02 **BC16K-10**	2 ft (0.6 m) 10 ft (3.05 m)	ThinWire patch cord	Patches ThinWire patch panel to DEMPR
BC16M-06 **BC16M-15** **BC16M-30**	6 ft (1.8 m) 15 ft (4.6 m) 30 ft (9.2 m)	ThinWire 802.3/Ethernet PVC cable with BNC connectors and boots	ThinWire 802.3/Ethernet products
BC16U-10	10 ft (3.1 m)	Cross-connect for 8-pin MP DETPR 10BaseT repeater to existing DECconnect wiring.	
BC17C-10 **BC17C-25**	10 ft (3.1 m) 25 ft (7.6 m)	Full EIA-232C/CCITT V.28 modem cable, round, 17-wire, fully shielded, male-to-female molded connectors	802.3/Ethernet Communications Servers (DCSAX-LA line cards)
BC17D-10 **BC17D-25** **BC17D-50** **BC17D-A0**	10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m)	EIA-232C/CCITT V.28, fully shielded, null modem, 10-wire, female-to-female molded connectors	802.3/Ethernet Communications Servers (DCSAX-LB line cards)
BC17E-25	25 ft (7.6 m)	CCITT V.35, fully shielded, modem cable (Note: This cable has an EIA-449 connector on the CPU end, and a V.35 connector on the modem end.)	802.3/Ethernet Communications Servers (DCSAX-LB line cards), DMR
BC17N-24	24 ft (7.3 m)	*Connectors:* One female and one male 50-position D-subminiature	Connects TU80/TU81 tape with CPU
BC19M-10	10 ft (3.1 m)	Parallel printer cable	Connects parallel printers to PCs
BC22D-10 **BC22D-25** **BC22D-50** **BC22D-A0** **BC22D-B0** **BC22D-B5**	10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m) 200 ft (61.0 m) 250 ft (76.2 m)	Null modem cable, round, 6-wire, fully shielded, EIA-232C/CCITT V.28, female-to-female molded connectors	Local connection of asynchronous terminals
BC22E-02 **BC22E-10** **BC22E-25** **BC22E-50** **BC22E-A0** **BC22E-B0** **BC22E-B5**	2 ft (0.6 m) 10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m) 200 ft (61.0 m) 250 ft (76.2 m)	Modem cable, round, 16-wire, fully shielded, EIA-232C/CCITT V.28, male-to-female molded connectors	Connection of asynchronous modems
BC22F-10 **BC22F-25** **BC22F-50** **BC22F-A0** **BC22F-B0**	10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m) 200 ft (61.0 m)	Full, EIA-232C/CCITT V.28 modem cable, round, 25-wire, fully shielded, male-to-female molded connectors	Connections of synchronous modems

Order Number	Length	Description	Where Used
BC22H-02	2 ft (0.6 m)	Female-to-male converter	
BC22J-02	2 ft (0.6 m)	Male-to-female converter	
BC22U-10 **BC22U-25** **BC22U-50**	10 ft (3.1 m) 25 ft (7.6 m) 50 ft (15.2 m)	Full, EIA-232C/CCITT V.28 modem cable, D-subminiature connector, fully shielded, male-to-female molded connectors	KMV1A configuration in BA2xx enclosure
BC22W-25 **BC22W-50**	25 ft (7.6 m) 50 ft (15.2 m)	EIA-422/423 communications cable, 37-conductor, D-subminiature connector, fully shielded, molded connectors	KMV1A configuration in BA2xx enclosure
BC23T-10 **BC23T-25**	10 ft (3.1 m) 25 ft (7.6 m)	ISDN communications cable	DIV32 ISDN interface
BC26V-6D **BC26V-12** **BC26V-25** **BC26V-50** **BC26V-80**	6 ft (1.85 m) 12 ft (3.7 m) 25 ft (7.6 m) 50 ft (15.2 m) 80 ft (24.4 m)	*Connectors:* Two 8-position, 2 by 4 (four signal, four ground)	Interfaces between controllers and storage interconnect (SI) type storage devices
BC27A-30 **BC27A-50**	30 ft (9.3 m) 50 ft (15.2 m)	37-position female D-connector to 50-position male D-connector shielded cable	Parallel printer cable
BC55D-50	50 ft (15.2 m)	EIA-423-A/EIA-449 interface connectors	Connection of DMR, DMP, DMV options
BC55T-25 **BC55T-50** **BC55T-A0** **BC55T-B5**	25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m) 250 ft (76.2 m)	Integral modem, twinaxial cable with BNC connectors	Connects fully shielded DMR, DMP, DMV options
BCC05-10 **BCC05-25** **BCC05-50** **BCC05-A0**	10 ft (3.0 m) 25 ft (7.6 m) 50 ft (15.2 m) 100 ft (30.5 m)	*Connectors:* One 9-position female D-subminiature and one 25-position female D-subminiature	Fully shielded printer cable
BN24A-2E **BN24A-3E**	8.2 ft (2.5 m) 11.8 ft (3.6 m)	Daisychain office cable	Daisychain faceplate connector is required
BN24B-01 **BN24B-03** **BN24B-4E** **BN24B-10** **BN24B-20** **BN24B-30**	3.2 ft (1 m) 9.8 ft (3 m) 14.8 ft (4.5 m) 32.8 ft (10 m) 65.6 ft (20 m) 98.4 ft (30 m)	FDDI × FDDI cable assembly with crossover	Connects FDDI-compatible devices where a transmit/receive crossover is required
BN24D-01 **BN24D-03** **BN24D-4E** **BN24D-10** **BN24D-20** **BN24D-30**	3.2 ft (1 m) 9.8 ft (3 m) 14.8 ft (4.5 m) 32.8 ft (10 m) 65.6 ft (20 m) 98.4 ft (30 m)	FDDI × 2.5-mm bayonet connection cable assembly	
BN24E-01 **BN24E-03** **BN24E-4E** **BN24E-10** **BN24E-20** **BN24E-30**	3.2 ft (1 m) 9.8 ft (3 m) 14.8 ft (4.5 m) 32.8 ft (10 m) 65.6 ft (20 m) 98.4 ft (30 m)	Dual 2.5-mm bayonet connection cable assembly	
BN24F-03 **BN24F-04**	9.8 ft (3 m) 13.1 ft (4 m)	Two twisted-pair cable configured with 8-pin modular plugs and crossover pinning	Connects 10BaseT workstation to 8-pin faceplate connector; used in conjunction with DETPR or other repeaters that do not implement an internal crossover

Order Number	Length	Description	Where Used
BN24G-01 **BN24G-03** **BN24G-04** **BN24G-07**	3.3 ft (1 m) 9.8 ft (3 m) 13.1 ft (4 m) 23.0 ft (7 m)	Four twisted-pair cable configured with 8-pin modular plugs and wired pin to pin	Used as OPEN DECconnect patch cord to connect H3107-L/M/N patch panel inserts; also used as an office cable for ISDN or as an office cable for 10BaseT workstations where the crossover is internal to the repeater
BN24H-03 **BN24H-04**	9.8 ft (3 m) 13.1 ft (4 m)	Three twisted-pair cable configured with one 6-pin modified modular plug, one standard 8-pin modular plug, and crossover pinning	Connects the 6-pin MMJ port of a terminal or printer to the 8-pin MJ faceplate outlet jack
BN24J-01 **BN24J-03** **BN24J-07**	3.2 ft (1 m) 9.8 ft (3 m) 22.9 ft (7 m)	Three twisted-pair cable configured with one 6-pin modified modular plug and one standard 8-pin modular plug (pin-to-pin wiring)	Connects the 6-pin MMJ port of EIA-423 server to the 8-pin MMJ patch panel insert jack
BN24K-03	9.8 ft (3 m)	Shielded 18 twisted-pair cable configured with one male 36-position right angle connector and one male 50-position straight connector	Connects the 36-position port of a DECserver 200/DL or CXA16 terminal server to the 50-position port of the H3107-M patch panel insert
BN24L-03	9.8 ft (3 m)	Octopus cable configured with eight 6-pin modified modular plugs and one male 50-position straight connector	Connects the 6-pin MMJ port of an EIA-423 server to the 50-position port of the H3107-M patch panel insert
BN24M-03	9.8 ft (3 m)	Octopus cable configured with eight-position standard modular plugs and one male 50-position straight connector	Connects the 8-pin MMJ ports of a 10BaseT server to the 50-position port of the H3107-M patch panel insert
BN24N-03	9.8 ft (3 m)	Octopus cable configured with eight-position standard modular plugs and one male 36-position right-angle connector	Connects the 36-position port of DECserver 200/DL or CXA16 terminal server to the 8-pin MMJ ports of the H3107-N patch panel insert
BN25G-0E **BN25G-01** **BN25G-03** **BN25G-04** **BN25G-07**	1.6 ft (0.5 m) 3.3 ft (1.0 m) 9.8 ft (3.0 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP high performance grade 4-pair cable. This cable is wired pin to pin.	DECconnect patch cord or 10BaseT or Token Ring office cable
BN25J-10 **BN25J-20** **BN25J-50** **BN25J-A0** **BN25J-B5** **BN25J-E0**	32.8 ft (10 m) 65.6 ft (20 m) 164.1 ft (50 m) 328.2 ft (100 m) 820.0 ft (250 m) 1640.0 ft (500 m)	VCS FOSHA-AC/AD fiber optic cable	Connects DHF11 remote terminal concentrator to DHF11 controller, and parallel printers to LP11, DMB32, LPV11, LPV11-SA, DSRVP-AA via LLF01-A
BN26K-0E **BN26K-03** **BN26K-04** **BN26K-07**	1.6 ft (0.5 m) 9.8 ft (3.0 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP 2-pair office cable for 10BaseT wired pin to pin	10BaseT repeaters that use an internal crossover (DETMR)
BN26L-03 **BN26L-04** **BN26L-07**	9.8 ft (3.0 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP shielded high-performance grade 2-pair cable wired pin to pin	10BaseT repeaters that use an internal crossover (DETMR)
BN26M-0E **BN26M-01** **BN26M-03** **BN26M-04** **BN26M-07**	1.6 ft (0.5 m) 3.3 ft (1.0 m) 9.8 ft (3.0 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP shielded high-performance grade 4-pair cable wired pin to pin	Shielded open DECconnect patch cord or 10BaseT or Token Ring office cable
BN26N-03 **BN26N-04** **BN26N-07**	9.8 ft (3.0 m) 13.1 ft (4.0 m) 22.3 ft (7.0 m)	8-MP to 8-MP shielded high-performance grade 2-pair cable wired with crossover	10BaseT repeaters that do not implement an internal crossover (DETPR)
BNCIA-10 **BNCIA-20** **BNCIA-45**	32.8 ft (10 m) 65.6 ft (20 m) 147.6 ft (45 m)	*Connectors:* BNC-type connectors	Cable set that connects CPU/storage controllers to the Star Coupler

Order Number	Length	Description	Where Used
BNE2A-MA **BNE2A-MB** **BNE2A-MC** **BNE2A-ME**	76.8 ft (23.4 m) 230.3 ft (70.2 m) 383.9 ft (117 m) 1640.4 ft (500 m)	Plenum-rated coaxial cable	Standard 802.3/Ethernet cable (backbone)
BNE2B-MA **BNE2B-MB** **BNE2B-MC** **BNE2B-ME**	76.8 ft (23.4 m) 230.3 ft (70.2 m) 383.9 ft (117 m) 1640.4 ft (500 m)	PVC-insulated coaxial cable	Ethernet
BNE3H-05 **BNE3H-10** **BNE3H-20** **BNE3H-40**	16.4 ft (5 m) 32.8 ft (10 m) 65.6 ft (20 m) 131.2 ft (40 m)	PVC-insulated transceiver cable with straight connector	IEEE 802.3
BNE3K-05 **BNE3K-10** **BNE3K-20** **BNE3K-40**	16.4 ft (5 m) 32.8 ft (10 m) 65.6 ft (20 m) 131.2 ft (40 m)	PVC-insulated transceiver cable with right-angle connector	IEEE 802.3
BNE3L-05 **BNE3L-10** **BNE3L-20** **BNE3L-40**	16.4 ft (5 m) 32.8 ft (10 m) 65.6 ft (20 m) 131.2 ft (40 m)	Plenum-rated transceiver cable with straight connector	IEEE 802.3
BNE3M-05 **BNE3M-10** **BNE3M-20** **BNE3M-40**	16.4 ft (5 m) 32.8 ft (10 m) 65.6 ft (20 m) 131.2 ft (40 m)	Plenum-rated transceiver cable with right-angle connector	IEEE 802.3
BNE4C-02 **BNE4C-05**	6.6 ft (2 m) 16.4 ft (5 m)	Office transceiver cable with PVC insulation, straight connector	IEEE 802.3
BNE4D-02 **BNE4D-05**	6.6 ft (2 m) 16.4 ft (5 m)	Office transceiver cable with PVC insulation, right-angle connector	IEEE 802.3
BS06M-21	21.0 ft (6.4 m)	37-position to 40-position (via adapter) cable	Connects DRV1W-Sx to Q-bus VAX or PDP-11 systems
H4010-AA	BA2xx to BA4xx connection kit	For connections between BA2xx series enclosures and BA4xx series enclosures.	
H8243-A	1000.0-ft (300 m)	PVC-insulated ThinWire cable spool	ThinWire 802.3/Ethernet products
H8244-A	1000.0-ft (300 m)	Plenum-rated ThinWire cable spool	ThinWire 802.3/Ethernet products
H8245-A **H8246-A**	1000.0-ft reel PVC 1000.0 ft reel Plenum rated	DECconnect Terminal Interconnect.	Connects faceplate or wallplate to SER

MMJ Accessories

Order Number	Description
BC16E-02 **BC16E-10** **BC16E-25** **BC16E-50** **BC16E-A0**	EIA-423 office cable
H0401-A	Crossover switch (four EIA-423 connectors)
H8571-C	25-pin male EIA-423 DECconnect to EIA adapter (with 5 male pins) with mating hex nuts
H8571-D	Full 25-pin male EIA-423 DECconnect to EIA filtered adapter with jack screws
H8571-E	EIA-423 DECconnect 25-pin adapter with jack screws
H8571-J	9-pin MMJ adapter
H8572-00	MMJ cable extender
H8575-A	Female 25-pin EIA-423 DECconnect MMJ to EIA general-purpose adapter with jack screws
H8575-B	Female 9-pin EIA-423 DECconnect to printer adapter with jack screws
H8672-A	PC to printer interconnect kit

Note: The associated connections in the following charts are not a statement of software/firmware device support, only of physical connectivity.

Communications

Device from	Device to	Cable used, adapter needed
DECSA	LA210/LA120/LA100/LA50/LG31/LN03 LQP02/VT100/VT200/VT300[1]/VT420[1]	BC22D
	LA70[1]/LA324[1]/DEClaser 2000 series[1]/LA75[1]/LJ250[1]/VT300[1]/VT420[1]	H8575-A + BC16E
	DF100/200 asynchronous modems	BC22E or BCC14
	DF100/200 series synchronous modems (2400 baud or less)	BC22F
	DF100 series synchronous modems (over 2400 baud)	BC17C
	DECSA, host CPU	BC17D
	Local synchronous connection	BC17D
	V.35 modems	BC17E
CXY08[2] DSRVA DSRVB-AA	DECmate/PRO-300/Rainbow/VAXmate DHQ11/DHU11/DMB32/DZ11 LA210/LA120/LA100/LA50/LG31/LN03 LQP20/VT100/VT200/VT300[1]/VT420[1]	BC22D
	LA70[1]/LA324[1]/DEClaser 2000 series[1]/LA75[1]/LJ250[1]/VT300[1]/VT420[1]	H8575-A + BC16E
DSRVP-AA	LG01/LG02/LP27/LP37/LP29 parallel printers	BC27A
CXY08[2] DSRVB-AA	DF100/200 asynchronous modems operating at 2400 baud or slower	BC22E or BCC14
	DF100 synchronous modems operating at 4800 baud or faster	BC22F

EIA-423 Open DECconnect Version Communications Interfaces

Device from	Device to	Cable used, adapter needed
CXA16[3] DHB32[3] DHQ11[3] DHT11[3] DHV11[3] DSRVB-B[3]	LA210/LA120/LA100/LA50/LG31/LN03 LQP02/DECmate/PRO-300/Rainbow VAXmate/DHQ11/DHU11/DMB32/DZ11 VT100/VT200	H8575-A + BC16E
CXA16[4] DSRVB-B[3]	LA75[1]/LJ250[1]/VT300[1]/VT420[1]/LA70[1] DEClaser 2000[1]/LA324[1]	BC16E
DSRZC	DM3XX EIA-422 Local Connect	BC19Y
DFMZA	LA210/LA120/LA100/LA50/LG31/LN03 LQP02/VT100/VT200/VT300[1]/VT420[1]	BC22D
	LA70[1]/LA324[1]/DEClaser 2000 series[1]/LA75[1]/LJ250[1]/VT300[1]/VT420[1]	H8575-A + BC16E
	DF100 synchronous modems	BC22F
	DECmate/PRO-300/Rainbow/VAXmate	BC22D
	DFMZA (EIA-423)	BC17D
DELNI DESTA H4000 H4005	DEBET/DEBNA/DECSA/DELQA/DELUA DEMPR/DEMSA/DEQNA/DESNA DESNC/DESQA/DESVA-B/DSRVA DSRVB/DSRVC/DSRVS/DSRZA	BNE3x
DELNI DESTA H4000	DECNA	BCC06 + BNE3x
H4000	DEREP	BNE3x

EIA-423 DECconnect Version Communications Interfaces *(Continued)*

Device from	Device to	Cable used, adapter needed
DEMPR DESPR	DEPCA/DESTA/DESVA/VAXmate[5]	BC16M
DMR11 DMP11 DMV11	EIA-422/423 modems	BC55D
	DMR11/DMP11/DMV11 (integral point)	BC55S or BC55T
	DF100 synchronous modems operating faster than 2400 baud	BC17C
	V.35 modems	BC17E
	DF100/200 modems operating at 2400 baud or slower	BC22F
CXY08[6] DHQ11[6] DHU11[6] DHV11[6] DMB32[6] DMF32[6] DMZ32[6] DZ11[6] DZ32[6] DZQ11[6] DZV11[6]	DECmate/PRO-300/Rainbow/VAXmate LA210/LA120/LA100/LA50/LG31/LN03 LQP02/VT100/VT200/VT300[1]/VT420[1]	BC22D
	LA70[1]/LA324[1]/DEClaser 2000 series[1]/ LA75[1]/LJ250[1]/VT300[1]/VT420[1]	H8575-A + BC16E BC22E or BCC14
	DF03/DF112/DF124/DF126/DF224/DF242	BC22F
	DF126/DF127/DF129	
DMB32[6] DMF32[6]	DF112/DF124/DF126/DF224/DF242 (asynchronous only)	BC22E or BCC14
	DF126 (synchronous only) 2400 baud and slower	BC22F
	DF127/DF129 (synchronous only) faster than 2400 baud	BC17C
	DMF32/DMB32 (synchronous integral modem)	BC17D
	LA210/LA120/LA100/LA50/LG31/LN03 LQP02/VT100/VT200/VT300[1]/VT420[1]	BC22D
	LG01/LG02/LP25/LP26/LP27/LP29	BC27A
	LP04/LP14	BC27B
DF03 DF112 DF124 DF126 DF224 DF242 DFM04-16	CXY08/DH11/DHB32/DHQ11/DHV11 DHT11/DHU11/DMB32/DMF32/DMZ32 DV11/DZ11/DZQ11/DZV11/LA210/LA120 LA100/LN03/VT100/VT200/VT300[1]/VT420[1] DECmate/PRO-300/Rainbow/VAXmate	BC22E or BC22F BCC14
DF126 DF127 DF129	DMB32/DMC11/DMF32/DMP11/DMR11/ DMV11/DPV11	BC17C
DFM04-16	VT100/VT200/VT300[1]/VT420[1] DECmate/PRO-300/Rainbow/VAXmate	BCC14
	LA210/LA120/LA100/LA50/LG31/LN03 LQP02/DHB32/DHU11/DMB32/DMF32 DHQ11/DHV11/DZQ11	BC22E or BC22F
	DFM04-16 (concentrated link port only)	BC22L
	DF100/200 modems on channel ports only	BC22M

Video Terminals

Device from	Device to	Cable used, adapter needed
VT100-180	LA70/LA324 DEClaser 2000 series/LA75/LJ250 LA70[1]/LA324[1]/DEClaser 2000 series[1]/LA75[1]/LJ250[1]	BC16E H8575-A
	LA50/LA100/LA210/LG31/LN03/LQP02/LQP03	BC22D
VT200 Series	LA70[1]/LA324[1]/DEClaser 2000 series[1]/LA75[1]/LJ250[1]	H8575-B
	LA50/LA100/LA210/LN03/LQP02/LQP03	BCC05

Video Terminals *(Continued)*

Device from	Device to	Cable used, adapter needed
VT300 Series VT420	LA70[1]/LA324[1]/DEClaser 2000 series[1]/LA75[1]/LJ250[1]	BC16E[7]
	LA50/LA100/LA210/LN03/LQP02/LQP03	H8575-A + BC16E
	LQP45	H8575-A+ BC16E or BC22D
VT100-VT180 VT200 VT300[1] VT420	CXY08/DECSA/DLVJ1/DHB32/DHF11 DHQ11/DHT11/DHU11/DHV11/DMB32 DMF32/DMZ32/DSRVA-AA/DSRVB-AA DSRZA	BC22D
	DF100-200 series asynchronous modems	BCC14 BC22E or BC22F
	DF100 series synchronous modems	BC22F or BCC04

Disks/Controllers

Disk Interfacing

Device from	Device to	Cable used, adapter needed
RA60 RA70 RA80/RA81/RA82 RA90/RA92 SA482 SA550 SA600/SA650 SA800/SA850	HSC5X-BA/HSC5X-DA/KDA50/KDB50/RB86/UDA50	BC26V

SCSI Disk Interfacing

Device from	Device to	Cable used, adapter needed
Any SCSI device	VAX 4000, DECsystem 5500, R400X, B400X	BC06P

CI Cluster Interconnect

Device from	Device to	Cable used, adapter needed
SC008	CI750/CI780/CIBCA/CIXCD HSC50/HSC70/HSC40	BNCIA

PC Products

Device from	Device to	Cable used, adapter needed
DECstation/DECpc Parallel Port	LA70/LA324/DEClaser 2000 series/LA75P[11]/LJ252[11]	BC19M
	LA210	LA10X-EP + BC19M[8]
DECstation/DECpc Serial Port	LA70/LA324/DEClaser 2000 series/LA75P[11]/LJ252[11]	H8575-J
	LN03[9]/LN03S[9]/LN03R/LA210	H8672-A
DECstation/DECpc	ThinWire Ethernet	DEPCA-CA

Printers/Hardcopy Devices

Device from	Device to	Cable used, adapter needed
LA50 LA100 LA210 LCG01 LCP01 LG01 (serial) LG02 (serial) LG31 LN03 LQP02 LQP45 LN03R	CXY08/DECSA/DLVJ1/DHB32/DHF11 DHQ11/DHU11/DHV11/DMB32/DMF32 DMZ32/DSRVA-AA/DSRVB-AA/VT100 series (EIA-232 devices)	BC22D
	DF100-200 series asynchronous modems	BC22E
	DF100 series synchronous modems	BC22F
	PC100 (Rainbow)	BCC14
	PC278/PRO-300/VT200 series	BCC05
	VAXmate/VT300[1] series/VT420[1]	H8575-A + BC16E

Printers/Hardcopy Devices *(Continued)*

Device from	Device to	Cable used, adapter needed
LA75[7] LJ250[7] LA70[7]	CXA16/DSRVB-B[3]/VAXmate/VT300[1] CK-DHB32-Lx/CK-DHQ11-Wx CK-DHV11-Wx	BC16E
LA324[7] DEClaser 2000 series[7]	CXY08/DECSA/DHB32/DHQ11 DHU11/DHV11/DMB32/DMF32 DMZ32/DSRVA/DSRVB-A/DSRZA DZ11/DZ32	H8575-A
LVP16	Rainbow	BCC19
	DECmate/PRO-300/VT200 series	BCC20
	Y cable to daisychain to second printer	BCC24
LG01 LG02 LP25 LP26 LP27 LP29 LP37	DMB32/DMF32/LP11/LPV11/DSRVP-AA LPV11-SA	BC27A BC27L
LP05 LP14	DMB32/DMF32/LP11/LPV11	BC27B
LLD11 LN01K-AA LN01K-LF	LSP25/LSP26/LSP27/long-line LN01	BN27D
LLF01-A	LP27/LP29/LG01/LG02/LP37	BN25J

Fiber Optics

Device from	Device to	Cable used, adapter needed
LP11 DMB32 LPV11 LPV11-SA DSRVP-AA	LG01/LG02/LP27/LP29	BN25J[10]

Tapes

Device from	Device to	Cable used, adapter needed
TA78 TA79 TA81 TA90	HSC40/HSC50/HSC70	BC26V
TU80 TU81	Controller	BC17N

Notes:
1. LA70/LA324/DEClaser 2000 series/LA75/LJ250/VT300 series/VT420 use EIA-423 DECconnect cabling. LA70/LA324/DEClaser 2000 series/LA75/LJ250 require H8571/H8575 adapters when attaching to EIA-232, 25-pin, D-type, subminiature, asynchronous connections. VT330+, VT340+, and the VT320 international model use EIA-423 DECconnect and EIA-232 communication ports. The VT320 North American model uses EIA-423 and ships with an H8571-F adapter for EIA-232 connections.
2. CXY08 is an 8-line EIA-232 option module for the DECserver 500 and BA213/BA214-based MicroPDP and MicroVAX/VAXstation systems.
3. EIA-423 DECconnect communication is standard.
4. CXA16 is a 16-line option module that implements the EIA-423 6-pin MMP/MMJ DECconnect architecture for the DECserver 500 and BA213/BA214-based MicroPDP and MicroVAX/VAXstation systems.
5. T-connector is required.
6. EIA-232 communication is standard.
7. LA70, LA324, DEClaser 2000 series, LA75, LJ250, VT300, and VT420 ship with a BC16E DECconnect cable. No other cable is required to establish communication with the associated devices in the chart.
8. The LA10X-LE is the external parallel interface. It does not provide the customer with IBM character set (LA10X-LE). The LA10X-H provides both the LA10X-EP and LA10X-LE and is less expensive than purchasing each part separately.
9. The H8672-A is not required if you purchase PC-compatible options on the LN03 or LN03S printers.
10. For use only with LLF01-A Long-line Fiber Optic Interface connector modules.
11. The LJ252 and LA75P include the BC19M-10 parallel cable.

Chapter 7
Storage Devices

Digital Storage Solutions

Comparison Charts

Storage Controllers/Adapters

Storage I/O Servers

Storage Arrays

Storage Array Building Blocks

Disk Devices

Expansion Boxes (SCSI)

Optical Devices

CD-ROM Devices

Tape Devices

Digital Storage Solutions

Overview

Digital offers a broad and flexible range of storage solutions, suitable for application environments spanning the desktop, office, and data center. Depending upon performance and capacity requirements, users can choose Digital tape and optical products, large and small disks, and solid state disks. Most of these devices, along with storage arrays, controllers, and I/O servers, are based on a carefully planned framework of standardized interfaces called Digital Storage Architecture (DSA). DSA governs the interactions of all Digital host systems and storage subsystems. Two interfaces, Standard Interconnect (SI) and Digital Storage System Interconnect (DSSI), implement DSA.

Mindful of the growing need for more "open" technology, Digital also offers Small Computer System Interface (SCSI) storage products, Digital's implementation of the ANSI SCSI standard for drives, aimed at Digital's VAX- and RISC-based workstations, RISC servers, and multi-user PCs and PC LAN servers.

Digital continues its commitment to systems integration and investment protection by offering a range of connectivity options that permit the use of SCSI storage devices throughout a VAX environment. These include VAXBI and Hierarchical Storage Controller (HSC) cluster versions of SCSI peripherals.

Digital provides expertise in solving storage problems, with standard products or special offerings for unique customer requirements. Digital offers cost-effective solutions by focusing on solving customers' business problems.

Digital Storage Architecture

Today, virtually all of Digital's storage subsystems are based on DSA, thus protecting a customer's investment in Digital subsystems. With DSA, new storage products incorporating new technologies do not require additional software drivers or applications software modification.

With DSA storage solutions having subsystem-based intelligence, DSA can offload host-associated functions, thus providing more usable CPU power. Software compatibility and software migration are easily achieved with no loss in performance.

Storage devices for the SI interface support Digital's mid-range and high-end systems, while DSSI devices support DSSI VAXcluster systems and primary local storage.

The low-end family includes RX-series flexible disk drives and an extension of DSA—the RF-series Integrated Storage Element. It is complemented by the TK-series cartridge tape drives, which have their own controllers. This edition features a new generation of tape products, the Tx86 family. The Tx86 family increases capacity while maintaining the high performance, high capacity, and unsurpassed data integrity in unattended backup of the Tx85 tape products.

Standard Interconnect Series Family (SDI/STI)

The SI family of Standard Disk Interconnect (SDI) devices and Standard Tape Interconnect (STI) devices provide high-capacity, high-performance, and high-reliability storage for Digital's mid-range and high-end systems. The SI family includes RA-series disk drives, storage arrays, TA-series tape drives, HSC90, HSC70, HSC60, and HSC50 I/O servers, KDM70, KDB50, KDA50, and UDA50 board controllers.

SDI drives are available in storage arrays, including the new DECarray 300 family which also takes DSSI, SA900 and SA800 storage arrays, and the SA905 computer-room removable storage array.

SDI drives are also sold in 1-meter (40-inch) cabinets with single-phase power, embedded in VAX 6000 system cabinets, and as single spindles for upgrading existing configurations.

Standard Interconnect Series Family (SDI/STI) *(Continued)*

Features

- High data availability through VAX VMS Shadowing
- High performance through VAX Disk Striping and ESE50 solid-state disks
- Seek ordering—reorders I/O requests to improve I/O access time
- Overlapped seeks—transfers data from one disk while simultaneously seeking on other disks with outstanding I/O requests
- Rotational optimization—selects the disk nearest the beginning sector when more than one disk is positioned on cylinder
- Express queue—provides immediate servicing of I/O requests if required
- Speed matching buffers—use high-speed RAM to smooth the disk data burst rates to host CPU I/O bus
- Redundant header addresses—records disk block header information four times for more reliable sector location
- Automatic sector relocation—the automatic revectors process removes defective blocks from service and replaces them with others without causing shrinkage in disk capacity
- Error detection code—checks controller memory and data-path errors as well as ECC hardware operation
- Error reporting—reports all significant errors to the host system, enabling detection and preventive action, where needed, before subsystem failure or data loss

Digital Storage System Interconnect (DSSI) Family

The DSSI storage subsystem family is a building block set of storage products that offers highly competitive storage solutions. DSSI is ideal as primary local storage or as part of a DSSI VAXcluster system. With the addition of the magazine tape subsystem and storage cabinet, DSSI now offers solutions that meet storage and backup requirements from the office to the datacenter.

The DSSI family includes RF series disk-integrated storage elements, storage pedestals, storage array cabinets, TF series tape drives and magazine tape subsystems, KFQSA and KFMSA board adapters and embedded adapters. The new RF31T is Digital's fastest DSSI disk drive. The new DECarray 400 provides high-capacity storage using a variety of products. For unique versatility, DECarray 300 holds both DSSI and SI, both tape and disk devices. The SF220 performance DECarray is configured to hold SF35s, the half-rack building block that can house 12 3.25-inch RF35 disk drives.

Host computer interfaces for DSSI offer high availability and excellent performance to a broad range of VAX systems and servers.

Features

- Multiple DSSI buses supported on each host
- Up to seven ISEs supported per DSSI bus in a single-host configuration
- Integrated disk storage and tape backup in a single cabinet for VAX 10000, VAX 7000, and VAX 6000 systems
- Full DSA compliance and VAXsimPLUS support offer superior serviceability
- DSSI VAXcluster support and host-based volume shadowing provide high availability
- ISEs may be grouped into stripe sets and into shadow sets for higher performance
- Customer-selectable HISPEED mode allows flexible mixed-array high-performance configurations

Small Computer System Interface (SCSI)

As part of Digital's commitment to open systems, Digital provides an extensive offering of SCSI disk, tape, and CD-ROM storage devices. These devices conform to Digital's implementation of the ANSI SCSI standard for disk drives. The advantages to using an industry-standard SCSI bus include low cost, configuration flexibility, and investment protection. Digital SCSI products feature a family of disk drives that vary in form factor, capacity, and performance to match application requirements. The RZ26 SCSI disk drive has 1.05-Gbyte capacity, Digital's highest performing 3.5-inch SCSI disk. The TLZ06 tape drive supports multiple interfaces including SCSI, in a 4-mm DAT drive. A variety of third-party SCSI devices are also available for SCSI-based Digital systems.

SDI/DSSI Disk Drive Comparison Chart

	RA92	RA72	RA71	RF73	RF72	RF35	RF31	RF31T	RF31F
Capacity Formatted: Unformatted:*	 1.5 GB 2.0 GB	 1.0 GB 1.3 GB	 280 MB 350 MB	 2.0 GB 2.6 GB	 1.0 GB 1.4 GB	 1.1 GB 852 MB	 381 MB 499 MB	 381 MB	 200 MB 250 MB
Interface	SDI	SDI	SDI	DSSI	DSSI	DSSI	DSSI	DSSI	DSSI
Controller/adapter	HSCs, KDA50, KDB50, KDM70, UDA50			KFMSA/ KFQSA	KFMSA/ KFQSA	KFQSA	KFQSA/ KFMSA	KFQSA	KFQSA
Form factor (inches)	9	5.25	5.25	5.25	5.25	3.5	5.25	3.5	5.25
Performance† maximum request/s @50 ms @100 ms @150 ms	 45 53 –	 50 58 –	 48 56 –	 37 47 50	 34 44 50	 60 73 77	 29 41 46	 71 8.4 –	 36 47 51
Average seek time (ms)	16.0	12.5	12.5	12.9	13.4	9.5	15.3	6.9	12.2
Average rotational latency (ms)	8.81	8.3	8.3	8.3	8.3	5.6	8.3	5.6	8.3
Peak transfer rate (Mbytes/s)	2.8	2.0	2.0	2.7	2.0	3.3	2.0	3.3	2.0
Track cache (read-ahead)	No	No	No	Yes (512 Kb)	Yes	Yes (512 Kb)	Yes	Yes (512 Kb)	Yes

* Unformatted capacity provided for comparison purposes; only formatted capacity is user-accessible in any disk drive.
† All performance reflects raw drive hardware capability and may not include improvements due to controller optimizations.

Note: Previous measurements for I/O per second do not reflect the performance benefits of cache in the integrated controllers of the RF drives, nor do they reflect the performance benefits of HSC controller cache as an option. For these reasons, we have developed a new figure of merit, applicable across all disk drives, which represents a more typical workload of requests seen by a disk. The higher throughput reflects the performance benefit of controller cache. See following table.

Requests per Second	RA92	RA72	RA71	RF73	RF72	RF35	RF31T
@ 50 ms	104	113	113	67	55	100	112
@100 ms	113	121	121	79	69	109	120

3-High Storage Cabinet Capacity and Performance Comparison Chart

Array	SF100	SF2x0	SA900	Sx400	Sx300	RA92
Max. disk capacity, GB	10.2	61.3	40	102.2	61.3	9
Min. disk capacity, GB	4	4	0.7	4	4	1.5
Max. tape capacity, GB	18.2	36.4	—	72.8	109.2	—
Disk/tape supported						
SF73	1	6	—	10	6	—
SF72	1	6	—	10	6	—
SA71	—	—	1	—	6	—
SA72	—	—	6	—	6	—
RA92	—	—	10	—	6	—
SA70	—	—	—	—	2 (Migration only)	—
RA90	—	—	—	—	6 (Migration only)	6
TF857	1	2	(TA857 only)	4	6	—
SF35	1	2	—	4	6	—
Interface	DSSI	DSSI	SDI	DSSI	SDI/DSSI	SDI

Note: Transfer rate, seek time, and access time depend upon component devices used. See above chart.

SCSI Disk Drive Comparison Chart

Specifications	RZ23L	RZ24L	RZ25	RZ26	RZ56	RZ57	RZ58
Capacity							
Formatted	121.65 MB	245 MB	426 MB	1.05 GB	665.17 MB	1000 MB	1380 MB
Unformatted	–	–	493 MB	–	760 MB	1200 MB	1600 MB
Buffer size	64	256	60	512	64	256	256
Transfer Rate							
To/from media	1.5 MB/s	3.75 MB/s	3.2 MB/s	3.3 MB/s	1.875 MB/s	2.2 MB/s	3.8 to 5.0 MB/s
Bus/async	3.0 MB/s	4.0 MB/s	3.0 MB/s	5	1.6 MB/s	1.6 MB/s	1.6 MB/s
Bus/sync	4.0 MB/s	5.0 MB/s	4.0 MB/s	10	4.0 MB/s	4.0 MB/s	5.0 MB/s
Spiral transfer rate	1.13 MB/s	2.8 MB/s	2.8 MB/s	2.1	1.66 MB/s	2.19 MB/s	3.36–4.38 MB/s
Operating Environment							
Ambient temperature	10°–55° C (50°–131°F)	10°–55° C (50°–131°F)	10°–55° C (50°–131°F)	10°–50° C (52°–122°F)	10°–55° C (50°–131°F)	10°–55° C (50°–131°F)	10°–55° C (50°–131°F)
Relative humidity	8%–80%	8%–80%	8%–80%	10%–90%	8%–80%	8%–80%	8%–80%
Maximum wet bulb, noncondensing	25.6°C (78.1°F)	25.6°C (78.1°F)	25.6°C (78.1°F)	28°C (82°F)	26.5°C (79.7°F)	26.5°C (79.7°F)	25.6°C (78.1°F)
Altitude	–304.8 to 4572 m –1000 to 15,000 ft	–304.8 to 4572 m –1000 to 15,000 ft	–304.8 to 3048 m –1000 to 10,000 ft	2500 m 8000 ft	–304.8 to 4572 m –1000 to 15,000 ft	–304.8 to 4572 m –1000 to 15,000 ft	–304.8 to 4572 m –1000 to 15,000 ft
Heat dissipation (typical)	3.6	4.9	10	–	28	28	26
Temperature gradient	11°C/hr (20°F/hr)	11°C/hr (20°F/hr)	11°C/hr (20°F/hr)	–	11°C/hr (20°F/hr)	11°C/hr (20°F/hr)	11°C/hr (20°F/hr)
Shock and Vibration							
Shock	10 Gpk, 10±3 ms, 5 to 22 Hz, 0.01 in. DA, 22 to 500 Hz, 0.25 Gpk						
Vibration							
Acoustic Noise							
Idle (bel)	4.3	4.3	4.6	4.4	4.6	5.0	5.0
Seeking (bel)	5.0	4.8	5.0	5.0	5.7	5.7	5.7
Latencies							
Track-to-track seek	8 ms	5 ms	2.5 ms	0.1 ms	<4 ms	<4 ms	<3 ms
Average seek	19 ms	16 ms	14 ms	9.5 ms	<16 ms	<14.5 ms	<12.5 ms
Average access	26.8 ms	22.9 ms	20.8 ms	15.1 ms	24.3 ms	22.8 ms	18.1 ms
Average rotational latency	8.8 ms	6.9 ms	6.8 ms	5.6 ms	8.3 ms	8.3 ms	5.6 ms
Rotational speed (rev/min)	3409±0.5%	4306±0.5%	4412±0.5%	5400±0.5%	3600±0.5%	3600±0.5%	5400±0.5%
Recording density	36,250 b/in.	38,600 b/in.	38,843 b/in.	56,000 b/in.	31,846 b/in.	42,441 b/in.	42,130 b/in.
Track density (tracks/in.)	1850	1930	1760	2756	1440	1670	1854
Areal density (MB/in.^{2})	67.06	–	68.28	153	45.86	70.88	78.1
Read/write heads (data)	4	4	9	14	15	15	15
Software support VMS (version)	5.4-1	5.4-3	5.4-1	5.5 (generic device) 5.5-2 (full support)	5.2-1	5.3	5.5
Software support ULTRIX (version)	4.1	4.3	4.1	–	2.2D	2.2D	4.2A
Power							
Maximum seeking	3.8 W	5.7 W	14 W	16–49 W	32 W	32 W	33 W
Maximum startup	14.5 W	12.3 W	34.5 W	–	60.7 W	68.2 W	48 W
Functional							
Servo	Embedded	Optical	Dedicated	Embedded	Dedicated	Dedicated	Dedicated
Disks	2	2	5	7	8	8	8
Physical							
Height	2.5 cm (1.0 in.)	2.5 cm (1.0 in.)	4.1 cm (1.63 in.)	4.14 cm (1.63 in.)	8.3 cm (3.25 in.)	8.3 cm (3.25 in.)	8.3 cm (3.25 in.)
Width	10.2 cm (4.0 in.)	10.2 cm (4.0 in.)	10.2 cm (4.0 in.)	10.1 cm (4.0 in.)	14.6 cm (5.75 in.)	14.6 cm (5.75 in.)	14.6 cm (5.75 in.)
Depth	14.6 cm (5.75 in.)	14.6 cm (5.75 in.)	14.6 cm (5.75 in.)	14.6 cm (5.75 in.)	20.8 cm (8.2 in.)	20.8 cm (8.2 in.)	20.8 cm (8.2 in.)
Weight	0.5 kg (1.2 lb)	0.4 kg (1.05 lb)	0.8 kg (1.8 lb)	0.8 kg (1.8 lb)	3.8 kg (8.4 lb)	3.8 kg (8.4 lb)	3.8 kg (8.4 lb)

Tape Selection Chart

The chart below is a simplified guide to choosing a tape subsystem to meet most customer needs. To use the chart:

1. Determine whether system will be clustered or standalone (column 1).
2. If the system is standalone, determine which CPU(s) will be used (column 1).
3. Determine the amount of disk storage required, allowing for growth (column 2).
4. Use column 3 to determine the most appropriate tape unit for the applications listed.[3]

For atypical needs, such as a requirement for a specific media format, refer to the supplementary information on the following page.

Product Recommendations

Column 1	Column 2	Column 3	
System	Number of Gbytes of Disk[1] on System	Disk Backup, Data Collection, Archiving, SW Distribution[2]	Highest Speed Backup, Data Collection
VAXclusters DSSI	Any number Any number	SA100, SA106 TF85/TF857 TF86/TF867	TA91s + TU91s TF85/TF857 TF86/TF867
Standalone[4]			
VAX 9000 Systems	Any number	One or more TF857/TF867	TA91
VAX 6000/7000/10000 Systems	1–6 >6	TF85/TF86 One or more TF857/TF867	 TA91
VAX 8xxx Systems	1–4 >4	TLZ06** SZ106/SZ100**	TZ85/TZ86** SZ106/SZ100**
VAX 4000 Systems	1–4 1–6 >6	TLZ06* TF85/TF86 TF857/TF867	TF85/TF86 TF857/TF867
MicroVAX Systems	1–4 >4	TLZ06 TZ85/SZ100 TZ86/SZ106	TZ85/TZ86 TZ85/SZ100 TZ86/SZ106
DECsystems	Any number	TLZ06	TZ85/TZ86
applicationDEC Systems	Any number	TZK10/TLZ06	TLZ06
VAXstations/DECstations	0–4 0–1 >4	TLZ06 TZK10 TZ86/SZ106	TLZ06 TZ86/SZ106
Network Backup			
InfoServer 150	0–4 >4	TLZ06 TZ85/SZ100 TZ86/SZ106	TZ85/TZ86 TZ85/SZ100 TZ86/SZ106

Notes:

[1] 1 Gbyte = an 85% full RA90, two 85% full RA82s, one 85% full RF72 or RZ57, etc.

[2] Any of these media are suitable for customers to distribute software to other users. For receiving Digital's software distribution, the primary supported media are CD-ROM optical disks, TK cartridges, 9-track magtape. Note that Tx86 drives cannot read TK50 format media.

[3] Recommendations for additional applications:

Data Interchange: The TLZ06, TZK10, and TA90E all use industry-standard cartridge media and are suitable for many data interchange applications. The 9-track tape is the most universally used interchange medium. Customers may want to purchase or retain a 9-track drive for interchange purposes. TA79, TA81, TU81-Plus, TSZ07 and TS05 tape products provide a standard 9-track drive for many of our systems.

Transaction Journaling and Batch Processing: These applications are best served by systems with fast start/stop capability. TA91, TA90, and TA79 provide this function for VAX 6000 and VAX 9000 VAXcluster systems.

[4] ULTRIX currently does not support loaders; TA91, SZ100/SZ106 and Tx8x7 subsystems will require manual intervention if used on ULTRIX-based systems.

* With KZQSA adapter

** With KZBSA adapter

Tape Comparison Chart

Tape Drives	Densities (bits/in.)	Operating Mode	Interface	System Support	Typical Time to Back Up 1-Gbyte Disk (minutes)	No. of Reels or Cartridges to Back Up 1-Gbyte Disk
Cartridge						
TA90/TA91	38,000, 18 tracks	Streaming	HSC/ KDM70	VAXcluster VAX 9000 VAX 6000	16 (with one drive)	6 1–3 (TA91)
SA100	42,500, 48 tracks	Streaming	HSC	VAXcluster	30	0.4
SA106	42,500, 112 tracks	Streaming	HSC	VAXcluster	30	0.17
TF857/TF85	42,500, 48 tracks	Streaming	DSSI	VAX 9000 (TF857 only) VAX 6000 VAX 4000 MicroVAX 3xxx MicroVAX II	26	0.4
TF867/TF86	42,500, 112 tracks	Streaming	DSSI	Same as TF857 above	26	0.17
TZ85/SZ100	42,500, 48 tracks	Streaming	SCSI-2 VAXBI**	InfoServer 150 MicroVAX 3100 VAXstations DECstations VAX 8xxx	Depends on network or system performance	0.4
TZ86/SZ106	42,500, 112 tracks	Streaming	SCSI-2 VAXBI**	Same as TZ85 above	Same as TZ85 above	0.17
TK70	10,000, 48 tracks	Streaming	Q-bus	MicroVAX VAX 4000	185	4
TK50/TZ30	6666, 22 tracks	Streaming	UNIBUS Q-bus SCSI	VAX MicroVAX Workstations	370	11
TKZ08	43,200	Streaming	SCSI	RISC ULTRIX DECstations	80	0.5
TLZ08	N/A	Streaming	SCSI[1] Q-bus VAXBI	Workstations MicroVAX VAX 4000 VAX 6000	80	0.5
TLZ06	DDS and DDS-C Standard format	Streaming	SCSI[1] Q-bus VAXBI[2]	SCSI workstations MicroVAX 3100 VAX 4000 DECsystem 5xxx applicationDEC VAX 6000 VAX 8xxx	55	0.25
TZK10 **PCXAT**	QIC-320 QIC-525 Standard formats	Streaming	SCSI	SCSI workstations DECsystem 5xxx applicationDEC PCs	90	2–3
TKZ60	38,000	Streaming	SCSI Q-bus[1] VAXBI[2]	Workstations MicroVAX VAX 6000	20	5

[1] With KZQSA adapter.
[2] With KZBSA adapter.

Tape Comparison Chart *(Continued)*

Tape Drives	Densities (bits/in.)	Operating Mode	Interface	System Support	Typical Time to Back Up 1-Gbyte Disk (minutes)	No. of Reels or Cartridges to Back Up 1-Gbyte Disk
Reel-to-Reel						
TA79	1600/6250	Start/stop	HSC/ KDM70	VAXcluster VAX 9000 VAX 6000	71	7
TA81	1600/6250	Same as TU81-Plus	HSC/ KDM70	VAXcluster VAX 9000 VAX 6000	110	7
TU81-Plus	1600/6250	High-speed streaming Slow start/stop	VAXBI UNIBUS Q-bus	VAX MicroVAX DECsystems	114 (on UNIBUS) 95 (on VAXBI)	7
TSZ07	1600/6250	Streaming	SCSI Q-bus[1] VAXBI[2]	SCSI workstations MicroVAX VAX 4000 VAX 6000 VAX 8xxx	80	7
TSZ05/ TSV05/ TSU05	1600	Streaming	SCSI Q-bus UNIBUS	Workstations MicroVAX VAX	480	25

[1] With KZQSA adapter.
[2] With KZBSA adapter.

KDM70 XMI Disk/Tape Controller (SDI/STI)

The KDM70 single-host disk and tape controller is an XMI-based eight-port controller that offers full support for SDI-STI devices. The KDM70 supports up to eight RA-series disk drives, up to two TA-series tape formatters, including the high-performance SA-series storage arrays, the IBM-compatible TA90 tape drive, and up to two ESE20 solid-state disks.

The KDM70 provides high-performance I/O throughput by using a CVAX microprocessor to offload the host system. This is the first DSA controller that features Dynamic Channel Allocation (DCA) with the two data channels dynamically allocated among eight ports to achieve optimal performance.

Features

- Data buffering—provides buffering of up to 180 Kbytes of data
- Direct controller-to-host memory transfers
- Self-contained diagnostics—host-independent diagnostic capability
- Fully overlapped seeks, seek reordering, request fragmentation
- Self-contained diagnostics—provides host-independent diagnostics
- High availability—disk drives can be statically dual-ported to two separate KDM70s
- Data rate: 3.4 Mbytes/second sustained
- Request rate: 1200 I/O requests/second
- VAXsimPLUS support

Ordering Information

KDM70-AA	KDM70 controller with KDM70 software; comprises two XMI modules which occupy adjacent XMI backplane slots.
CK-KDM00-LF	Cabinet kit, 0.9-m (3-ft) internal SDI/STI controller-to-bulkhead cables and I/O distribution panels for use with VAX 10000/7000/6000 systems
CK-KDM00-LG	Same as above except for VAX 9000 systems
QA-YG5AA-H5/HM	KDM70 software H-kits (TK50/magtape); should only be ordered for self-maintenance customers requiring KDM70 software update; all other customers receive the kit via automatic distribution.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V	
KDM70-AA	2 XMI slots	17.40	0.00	0.00	0.00	0.00	4

KFMSA XMI Disk/Tape Adapter (DSSI)

The KFMSA disk and tape Integrated Storage Element (ISE) adapter is an XMI-based adapter that offers full compliance with the Digital Storage Architecture (DSA). It is available on the VAX 10000/9000/7000/6000 systems. The KFMSA adapter can support up to 14 RF72, RF73, or RF31/31-F* disk storage elements or combination of RF disk drives and TF8x/TF8xx series magazine tape subsystems. The KFMSA supports up to four TF ISEs (two per DSSI bus).

The KFMSA incorporates two 7-MIP I/O processors and a 45,000-gate array to create a very powerful storage adapter. It provides two 4-Mbyte packet multiplexing paths to storage elements with full error detection and retry. The KFMSA adapter's bandwidth and extremely low latency permit unconstrained performance of all attached storage elements.

* RF31/31-F drives require microcode release 256 or later to be supported.

Features

- Two DSSI buses supported
- Supports up to 14 DSSI Integrated Storage Elements (ISEs)
- Latency less than 1.5 ms on each DSSI bus
- Data rate: 8.0 Mbytes/second peak, 5.5 Mbytes/second sustained
- Request rate: capable of over 1,600–1,800 I/O requests/second
- Built-in automatic self-diagnosis
- VAXsimPLUS support

Ordering Information

KFMSA-BA	XMI-to-DSSI adapter for VAX 10000/9000/7000/6000 DSSI VAXcluster and storage-sharing applications. Required for VAX 6000 systems in DSSI VAXcluster configurations. Includes installation and user documentation. Requires one XMI slot.

Note: The KFMSA and CIBCA-A are not supported on the same system. The CIBCA-AA must be upgraded to the CIBCA-BA or CIXCD.

CK-KFMSA-LJ	Cable kit, two 1.2-meter (4-foot) internal cabinet DSSI cables. Connects XMI backplane (adapter) to VAX 6000 host computer I/O bulkhead. Also includes I/O bulkhead adapter plate (occupies two I/O panel units) and two DSSI bus terminators. Does not support KFMSA warm-swap and, within a DSSI VAXcluster configuration, can only be used on end-node VAX 6000s.
CK-KFMSA-LN	Cable/bulkhead kit includes two 2.4-meter (8-foot) internal cabinet DSSI cables. Connects host system I/O bulkhead to XMI backplane (adapter) and then connects the XMI backplane back to the I/O bulkhead. Required for KFMSA-BA warm-swap and KFMSA-BAs in the middle-node position of a DSSI VAXcluster configuration. Also includes I/O bulkhead adapter plate (occupies two I/O panel units) and two DSSI bus terminators.
CK-KFMSA-LK	Cable kit, two 1.2-meter (4-foot) internal cabinet DSSI cables. Connects XMI backplane (adapter) to VAX 9000 host computer I/O bulkhead. Also includes I/O bulkhead adapter plate (occupies two I/O panel units) and two DSSI bus terminators. For use with external DSSI ISEs.

Configuring Information

KFMSA-BA options required for SF200/SF210/SF400 configurations.

Number of RF72/73 Disk Drives		Options Required		
Single- and Two-System Host	Three- and Four-System Host	KFMSA-BA	CK-KFMSA-LN	Cabinet-to-Cabinet Interconnect
2–6	2–4	1	1	1
13–18	9–12	2	2	3
19–24	13–16	2	2	4
25–30	17–20	3	3	5
31–36	21–24	3	3	6
37–42	25–28	4	4	7
43–48	29–32	4	4	8
49–54	33–36	5	5	9
55–60	37–40	5	5	10
61–66	41–44	6	6	11
67–72	45–48	6	6	12
73–78	49–52	7	7	13
79–84	53–56	7	7	14
85–90	57–60	8	8	15
91–96	61–64	8	8	16
97–102	65–68	9	9	17
103–108	69–72	9	9	18
109–114	73–76	10	10	19
115–120	77–80	10	10	20
121–126	81–84	11	11	21
127–132	85–88	11	11	22
133–138	89–92	12	12	23
139–144	93–96	12	12	24

Notes

1. Use CK-SF200-xx for KFMSA-BA to SF2xx cabinet-to-cabinet interconnect.
2. Use BC21Q-xx for KFMSA-BA to SF400 cabinet-to-cabinet interconnect for VAX 6000/7000/9000/10000 systems.
3. Use BC22Q-xx for KFMSA-BA to SF400 cabinet-to-cabinet interconnect for VAX 4000 and Q-bus MicroVAX systems.
4. Use CK-SF100-xx for KFMSA-BA to KFMSA-BA cabinet-to-cabinet interconnect.
5. VAX 6000 supports up to 72 RF72/73s in SF series cabinet.
6. VAX 7000/10000 supports up to 144 RF72/73s.
7. To calculate maximum supported RF72/73s if TF8xs or TF8xxs are required in a two-system DSSI VAXcluster configuration, subtract two RF72/73s for every one TF8x or TF8xx required; for all other configurations, subtract one RF72/RF73 for every TF8x or TF8xx required.
8. All option requirements increase by 50 percent in two-system DSSI VAXcluster configurations when both systems are end nodes.

Configuring Information
(Continued)

KFMSA-BA Options Required for SF220/SF35 Configurations.

Number of RF35 Disk Drives				Options Required		
Single-System	Two-System	Three-System	Four-System	KFMSA-BA	CK-KFMSA-LN	Cabinet-to-Cabinet Interconnect
1–7	1–6	1–5	1–4	1	1	1
8–14	7–12	6–10	5–8	1	1	2
15–21	13–18	11–15	9–12	2	2	3
22–28	19–24	16–20	13–16	2	2	4
29–35	25–30	21–25	17–20	3	3	5
36–42	31–36	26–30	21–24	3	3	6
43–49	37–42	31–35	25–28	4	4	7
50–56	43–48	36–40	29–32	4	4	8
57–63	49–54	41–45	33–36	5	5	9
64–70	55–60	46–50	37–40	5	5	10
71–77	61–66	51–55	41–44	6	6	11
78–84	67–72	56–60	45–48	6	6	12
85–91	73–78	61–65	49–52	7	7	13
92–98	79–84	66–70	53–56	7	7	14
99–105	85–90	71–75	57–60	8	8	15
106–112	91–96	76–80	61–64	8	8	16
113–119	97–102	81–85	65–68	9	9	17
120–126	103–108	86–90	69–72	9	9	18
127–133	109–114	91–95	73–76	10	10	19
134–140	115–120	96–100	77–80	10	10	20
141–147	121–126	101–105	81–84	11	11	21
148–154	127–132	106–110	85–88	11	11	22
155–161	133–138	111–115	89–92	12	12	23
162–168	139–144	116–120	93–96	12	12	24

Notes

1. Use CK-SF200-LM for KFMSA-BA to SF2xx cabinet-to-cabinet interconnect.
2. Use BC21Q-xx for KFMSA-BA to SF400 cabinet-to-cabinet interconnect for VAX 6000/7000/9000/10000 systems.
3. Use BC22Q-xx for KFMSA-BA to SF400 cabinet-to-cabinet interconnect for VAX 4000 and Q-bus MicroVAX systems.
4. Use CK-SF100-LM for KFMSA-BA to KFMSA-BA cabinet-to-cabinet interconnect.
5. Use CK-SF100-LP for KFMSA-BA to VAX4000 cabinet-to-cabinet interconnect.
6. VAX 6000 supports up to 84 RF35s.
7. VAX 7000/10000 supports up to 168 RF35s.
8. To calculate maximum supported RF35s if TF8xs or TF8xxs are required, subtract one RF35 for every TF8x or TF8xx that is required.

Option	Mounting Requirements	dc Amps Drawn @					I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V	
KFMSA	1 XMI slot	6.0	0.00	0.00	0.00	0.00	2

KDB50 VAXBI Disk Controller (SDI)

The KDB50 is an intelligent controller that allows Standard Disk Interconnect (SDI) disk drives (including the ESE20 Electronic Storage Element) to be used with a variety of VAXBI system configurations. The KDB50 contains two high-speed microprocessors for disk-host communications and data routing through the KDB50's onboard memory buffer. The KDB50 can handle data bursts up to 3 Mbytes/second with a sustained throughput of 1.2 Mbytes/second. The controller consists of two VAXBI modules that can be mounted in adjacent VAXBI backplane slots, two intermodule cables, one internal SI (Storage Interconnect) cable to bulkhead, and one bulkhead connector assembly. Each controller can attach up to four radially connected RA series SDI disk drives, up to four ESE20 Electronic Storage Elements, or any four RA component drives in a storage array.

Features

- Stores up to 20 host I/O requests for disk optimization
- Request rate: up to 700 I/O requests/second
- Buffers up to 41 disk sectors to smooth the data rates between the disks and the host Q-bus port
- Direct controller-host memory transfers
- Indicates fault conditions on LED (light emitting diode) displays and in a hardware register that is readable by the host
- Supports VAXsimPLUS

Ordering Information

KDB50-C	KDB50 controller with 0.9-m (3-ft) controller-to-bulkhead cable. For use with VAX 6000 series internal and external VAXBI channels.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V		
KDB50-C	2 VAXBI slots	11.94	0.03	0.00	3.76	0.14	1	2

KFQSA Q-bus Storage Adapter (DSSI)

The KFQSA storage adapter is a single, quad-height module that provides a space-saving, low-power link between the Q-bus and DSSI. It is capable of supporting up to seven nodes, including any combination of DSSI-based storage devices or connection to another CPU. The KFQSA transfers commands and data between the host and ISEs using direct memory access (DMA) hardware, maximizing the number of CPU cycles available for additional applications development. The sustained data transfer rate is 1.5 Mbytes per second with a throughput limit of 190 I/Os per second.

The KFQSA uses the same Storage System Port (SSP) used by the RQDX3 and KDA50 controllers, and is supported by existing device drivers across all 32-bit operating systems. To ensure high data integrity, the adapter runs power-up, self-test diagnostics, provides online and offline diagnostics, and provides fault detection and isolation. Byte parity and packet error detecting code (EDC), combined with automatic retry, serve to ensure the highest level of data integrity.

Features

- Occupies a single slot in the Q-bus backplane and requires low power
- Links Q-bus VAX, MicroVAX, and DECsystem computer systems to DSSI for expanded system performance and high storage capacity
- Offers support for high-availability, dual-host configurations with VMS V5.1-1 and higher
- Makes more CPU cycles available for application use with Direct Memory Access (DMA) hardware moving data between adapter and main memory
- 190 I/Os per second throughput
- 1.5 Mbytes per second sustained data rate

Ordering Information

KFQSA-AA	Q-bus-to-DSSI adapter, field installed into BA23 or H9642 system enclosure.
KFQSA-BA	Q-bus-to-DSSI adapter, field installed into BA123 system enclosure.
KFQSA-SA	Q-bus-to-DSSI adapter, factory installed for BA213 system enclosure and rtVAX 3800 system only.
KFQSA-SE/SG	Additional DSSI adapter. For DECsystem 5400 and DECsystem 5500 systems, BA4xx, BA2xx, and H9644 enclosures; factory/field installed.

Note: Requires **BC21M-09** cable; order separately.

Configuring Information

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
KFQSA	1	5.5	0.00	27.50	4.4	0.5

KZQSA Q-bus Storage Adapter

The KZQSA adapter provides the capability to connect TLZ06, RRD42, and TSZ07 devices to Q-bus MicroVAX and VAX 4000 systems (only one TSZ07 per KZQSA is supported). DECsystem 5500 systems can use the KZQSA to connect the above devices as well as RZ25, RX23, RX33, RZ56, RZ57, TZ30, and TZK10. (KZQSA cannot be used to connect TKZ08 to DECsystem 5500.)

The KZQSA is a quad-height module with an integral handle that has two standard connectors. There is no termination on the module.

Ordering Information

KZQSA-AA	For use with MicroVAX II system in BA23 enclosure; field installed.
KZQSA-BA	Same as above except for BA123 enclosure
KZQSA-SA/SF	For use with BA2xx, BA4xx, and B400X enclosures; factory/field installed.
KZQSA-CA	For use with DECsystem 5500; factory or field installed.

Configuring Information

- Q-bus MicroVAX and VAX 4000 systems support two KZQSA adapters per system; each KZQSA supports two devices. Each adapter requires one Q-bus slot.
- DECsystem 5500 systems support two KZQSA adapters per configuration; each KZQSA supports up to seven devices. Each adapter requires one Q-bus slot. Devices connected to DECsystem 5500 systems by KZQSA cannot be used as boot devices.

Option	Q-bus Slots	dc Amps Drawn @		Watts Drawn	Bus Loads Drawn	
		5 V	12 V		ac	dc
KZQSA	1	5.4	0.0	27.0	4.4	0.5

KDA50 Q-bus Disk Controller

The KDA50 implements the Digital Storage Architecture (DSA) and allows Standard Disk Interconnect (SDI) disk drives (including the ESE20 Electronic Storage Element) to be used with a variety of Q-bus system configurations. The KDA50 is an intelligent board controller containing two high-speed microprocessors for disk-host communications and data routing through the KDA50's onboard memory buffer. The KDA50 is capable of handling data bursts up to 3 Mbytes/second with a sustained throughput of 1.15 Mbytes/second. The controller consists of two quad-height modules that can be mounted in adjacent Q-bus backplane slots, two intermodule cables, one internal SI (Storage Interconnect) cable to bulkhead, and a bulkhead specifically tailored for an application. Each controller can attach up to four radially connected RA series SDI disk drives or ESE20 Electronic Storage Elements in any combination.

Features

- Sustained throughput of 1.15 Mbytes/second
- Maximum I/O requests/second of 208 (208 QIOs)
- Stores up to 20 host I/O requests for disk optimization
- Provides buffering of up to 41 disk sectors in order to smooth the data rates between the high-speed disks and the host Q-bus port
- Direct controller-host memory transfers
- Indicates fault conditions on LED (light-emitting diode) displays and in a hardware register that is readable by the host
- Supports VAXsimPLUS

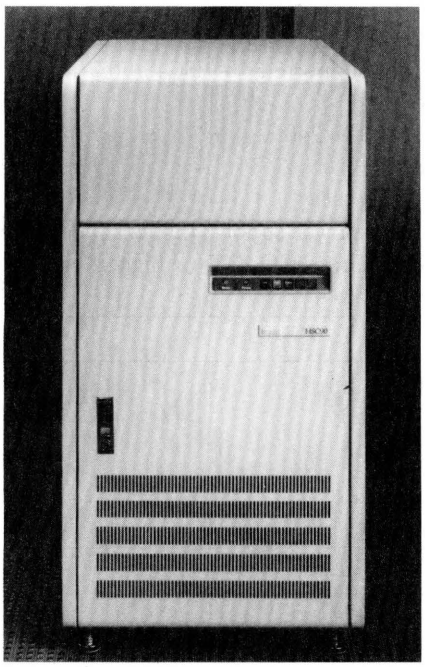
Ordering Information

KDA50-QA	Q-bus controller for MicroVAX II and Q-bus PDP systems
KDA50-SB/SC	Q-bus controller for H9644 cabinet or BE213 expansion pedestal; uses two Q-bus slots; factory/field installed
KDA50-SE/SG	Q-bus controller for B400X-, BA4xx-, and BA2xx-series enclosures; uses three Q-bus slots; factory/field installed

Configuring Information

Option	Q-bus Slots	dc Amps @		Watts Drawn	Bus Loads Drawn		I/O Panel Insert Size
		5 V	12 V		ac	dc	
KDA50-QA	2	13.5	0.03	67.86	3.0	0.5	(2)B
KDA50-SB/SC	2	13.5	0.03	67.86	3.0	0.5	N/A
KDA50-SE/SG	3	13.5	0.03	67.86	3.0	0.5	N/A

HSC90/HSC60 Intelligent I/O Servers



HSC90 and HSC60 intelligent I/O servers are CI-based disk and tape controllers that offer full architectural support for SDI disk drives from the SA, RA families, or a combination of SDI disk drives and TA series tape drives.

The HSC90 supports 48 SCI disk drives; HSC60 supports 20 disk drives or 12 tape ports. The use of the optional 32-Mbyte disk cache greatly enhances disk performance. This single module plugs into the HSC backplane and is shared by all selected disk drives connected to the HSC90/HSC60 controllers.

The HSC90 provides very high-performance I/O throughput using a new higher speed PDP-11-based microprocessor in conjunction with multiple high-speed bit-slice microprocessors. The HSC I/O server offloads all disk-management functions from the host systems and provides host-independent sharing of common data among medium- to large-sized CI VAXcluster systems. The HSC60 is the entry-level CI-based intelligent disk and tape controller that provides host-independent sharing of common data among small- to medium-sized CI VAXcluster systems.

The HSC controllers can serve several CI-bus interconnected host processors. Housed in standalone cabinets, they are independently powered and electrically isolated from the CPUs and storage devices they serve.

A video terminal and hardcopy printer are supplied with each HSC90 for utility operation and diagnostic purposes. **Note:** A cache needs analysis tool is available that provides valuable information in assessing the configuration load.

Features

- CI interface for higher CI throughput and loadable microcode
- Handles up to 1300 I/O requests per second
- Self-contained diagnostics—provides host-independent diagnostic
- Offline utilities—happening in parallel and providing volume backup and restore as well as disk formatting and format verification
- High availability—disk drives can be static dual ported to multiple HSCs of any variety
- Failover—re-establishes data path to disks after controller or data path failure
- CI bus bandwidth: 70 Mbits/second per data path; internal data bus: 13.3 Mbytes/second total
- Single-phase power requirements simplify site preparation.
- Disk data-channel bandwidth: 3.125 Mbytes/second maximum each
- Supports VAXsimPLUS

Additional HSC90 Features

- Stores up to 900 host command queues
- Provides data buffering for 512 Kbytes of data (512 disk sectors to insulate the CI bus from realtime dependency)
- Multiple processors may read and write shared files.
- HSC40, HSC60, and HSC70 controllers can be field upgraded to the HSC90.

Ordering Information

Note: Purchase of an HSC controller includes the H-kit for the HSC software. Customers must sign a no-charge license agreement and register it with Software Product Services. Scheduled software updates are automatic with the one-year warranty. Following the warranty period, an HSC hardware Digital Services contract includes a basic software contract that includes scheduled HSC software updates.

HSC90/HSC60 Intelligent I/O Servers *(Continued)*

HSC90-BA/BB	HSC90 with 48-port capability, 120 V/240 V
HSC60-BA/BB	HSC60 with 20-port capability, 120 V/240 V
HSC5X-DA	4-port disk/tape channel card
HSC9X-FA	8-port disk data channel (not supported on HSC40/50/70)
HSC6X-AA	HSC40 to HSC60 upgrade
HSC9X-CA/CB	HSC60 to HSC90 upgrade, 120 V/240 V
HSC9X-AA	HSC70 to HSC90 upgrade
HSC9X-BA	HSC90 cache option
HSC6X-BA/BB	HSC60 cache option, auxiliary power supply, 120 V/240 V
QL926-H7	Cache needs analysis tool; requires HSC V3.7 or higher; can be used with HSC40/60/70/90.

Specifications

Physical Characteristics

Height	105.9 cm (41.7 in.)
Width	54.0 cm (21.3 in.)
Depth	91.4 cm (35.0 in.)
Weight	240 kg (450 lb)

Note: Weight represents maximum configuration.

Power Requirements

NEMA receptacle type	L5-30R
IEC receptacle type	(See note)
PCS+/PDS+ cable type	BC24S
Number of phases	1

Model	Voltage Nominal V	Frequency Nominal Hz	Current in Amps Steady State				Thermal Dissipation	
			L1	L2	L3	N	Watts	Btu/kJ/h
HSC90/60-BA	120	60	12.3	N/A	N/A	12.3	785	3480 Btu/h
HSC90/60-BB	240	50	7.0	N/A	N/A	7.0	785	3670 kJ/h

Note: HSC90/60-BB incorporates removable line cord (17-00199-10). Power consumption and heat dissipation specs for these items do not include a channel (HSC5X-BA/DA, HSC9X-FA) device.

HSS90/HSS60 Cluster Starter Packages

HSS Cluster Starter Packages lower the entry cost of clustering. The easy-to-order packages contain the HSC I/O server, 4- and 8-port data channel cards, cables, and Star Coupler. VAXBI CI adapter included with HA/HB variants.

Ordering Information

HSS90-GA/GB	HSC90-BA/BB I/O server, HSC5X-DA disk/tape data channel, HSC9X-FA 8-port data channel, SC008-AC Star Coupler, and BNCIA-20 cable set, 120 V/240 V
HSS90-HA/HB	HSC90-BA/BB I/O server, HSC5X-DA disk/tape data channel, HSC9X-FA disk data channel, SC008-AC Star Coupler, two BNCIA-20 cable sets, and CIBCA-BA CI adapter, 120 V/240 V
HSS60-GA/GB	HSC60-BA/BB I/O server, HSC5X-DA disk/tape data channel, HSC9X-FA 8-port data channel, SC008-AC Star Coupler, and BNCIA-20 cable set, 120 V/240 V
HSS60-HA/HB	HSC60-BA/BB I/O server, HSC5X-DA disk/tape data channel, HSC9X-FA disk data channel, SC008-AC Star Coupler, two BNCIA-20 cable sets, and CIBCA-BA adapter, 120 V/240 V

HSC Rack-Mountable Subsystems

HSC rack-mountable subsystems are Hierarchical Storage Controller subsystems in a 48.3-cm (19-inch) wide, rack-mountable chassis. They provide the same functionality and technology as standard HSC subsystems, but mount in any EIA-standard 48.3-cm (19-inch) wide rack or enclosure, utilizing 62.2 cm (24.5 inches) of vertical rack space.

Based on the standard, cabinet version HSCs, rack-mountable HSCs use the same multiple high-speed microprocessors to locate, organize, and access data. They support the same combinations of SA or RA Standard Disk Interfaces (SDI) and TA series Standard Tape Interfaces (STI) and provide the same superior I/O throughput to optimize physical disk and tape operations.

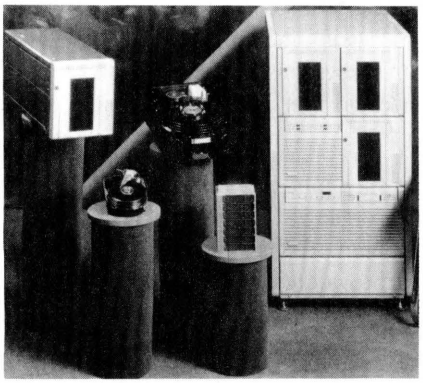
The rack-mountable HSC chassis extends the capabilities of the HSC to applications where severe footprint or environmental constraints prohibit use of the standard subsystems. It can be mounted with other equipment in one cabinet, mounted in air-conditioned enclosures for use in non-conditioned, non-computer room environments, or mounted in contaminant-protected (NEMA) cabinets for use in dusty, dirty areas such as warehouses or manufacturing facilities. Rack-mountable HSCs are configured according to application needs or can be ordered as chassis alone for mounting by the user.

The rack-mountable HSC is available in a number of models that support a wide range of SDI disk drives, or a combination of SDI disk drives and TA tape drives.

Ordering Information

All rack-mountable HSC subsystem configurations require a custom quotation which can be obtained through a EIC Sales Support Specialist. For more information, call the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

DECarray 300 Family (SDI/DSSI)



The DECarray 300 storage subsystem supports multiple bus configurations in one 1.1-meter (42-inch) high, single-phase cabinet. This space and power-efficient package is the first DECarray to combine SDI and DSSI disks as well as backup tape drives, making a wide variety of initial storage configurations available for high-end, mid-range, and low-end systems.

Investment is protected because SA71, SA72, RA92*, SF72, SF73*, TF857 and older SA70*, RA90* devices can be added to these initial configurations at any time. The DECarray 300 family offers the flexibility needed to meet the variety of storage demands generated by new applications, additional users, and network expansion. The SA70 can migrate a maximum of two boxes into the DECarray 300 cabinet.

The DECarray 300 is an excellent choice for mixed bus configurations and for mixed environments with constrained floor space. DECarray 300 family is compatible with any VAX or VAXcluster system as well as the full line of Digital's CI servers (HSC family), SDI controllers, and DSSI Integrated Storage Elements (ISEs) which have their own integrated controller and embedded MSCP server.

* Field-installed only.

Features

- Occupies only 5.5 ft^2 (0.5^2 m) of floorspace
- Variable drive capacity—systems can be configured for maximum capacity or maximum I/O throughput
- Accepts installation of up to six separately powered and cooled Storage Array Building Blocks (SABBs) or RA90/92 disk drives and up to six TF857 tape subsystems
- Each SABB can be either SDI or DSSI
- Each SDI SABB can hold up to four RA71 700-Mbyte (formatted) or four RA72 1.0-Gbyte (formatted) dual portable disk drives
- DSSI SABBs can hold up to four 1.0-Gbyte (formatted) RF72 ISEs, or up to four 2.0-Gbyte (formatted) RF73 ISEs
- Maximum disk storage capacity is 24 Gbytes (formatted) (24 RA72 drives) or 48 Gbytes (formatted) (24 RF73 ISEs)
- Maximum unattended tape storage backup capacity is 109.2 Gbytes (six TF857 tape drives). The TF857 tape subsystem consists of a DSSI-based streaming tape device and an automatic cartridge loader

Ordering Information

Note: DECarray storage enclosures are 1.1-meter (42-inch) cabinets. GBf refers to Gbytes formatted. Custom configurations are available from the factory with SDI SABBs.

SF300 DECarrays are configured for single systems, and require appropriate CK-SF200-Lx cable kits listed below:

SF300-CA/CD	DECarray with one SF72 SABB (4 GBf), 60/50 Hz
SF300-HA/HD	DECarray with three SF72 SABBs (12 GBf), 60/50 Hz
SF300-TE/TD	DECarray with one TF857 tape drive, 60/50 Hz

DECarray 300 Family (SDI/DSSI)
(Continued)

To upgrade SF300 DECarrays to multi-host systems, order one of the following.

CK-SF200-LM	2.7-m (9-ft) DSSI cable kit for VAX 6000/7000/9000/10000
CK-SF200-LP	2.7-m (9-ft) DSSI cable kit for VAX 4000 and MicroVAX
CK-SF200-L3	7.6-m (25-ft) version of -LM
CK-SF200-L7	15.2-m (50-ft) version for VAX 6000/7000/9000/10000
CK-SF200-L8	15.2-m (50-ft) version for VAX 4000 and MicroVAX systems

The following DECarrays require external **BC26V-12/25/50/80** cables—one per drive; duplicate set required for dual porting.

SA300-CA/CD	DECarray with one SA72 SABB (4 GBf), 60/50 Hz
SA300-HA/HD	DECarray with three SA72 SABBs (12 GBf), 60/50 Hz
SA301-CA/CD	DECarray with one SA71 SABB (2.8 GBf), 60/50 Hz
SA301-HA/HD	DECarray three SA71 SABBs (8.4 GBf), 60/50 Hz
SA300-XA/XD	Empty DECarray cabinet, 60/50 Hz

Note: For SDI RA disk drives, order external BC26V-12/25/50/80 cables separately. One per box unless dual porting, then two per box.

The following cables are required when adding SA/SF arrays and RA disks into the DECarray 3xx cabinet.

CK-SA300-L1	Mounting kit for 3HI of SA7X disk
CK-SA300-L2	Mounting kit for 3HI of RA9X SABB
SA71-AK	700-Mbyte RA71 for SA300, factory installed
SA71-BK	2.8-Gbyte version (four RA71s)
SA72-AK	1-Gbyte SABB, factory installed in DECarray 300 (one RA72)
SA72-BK	4-Gbyte SABB, factory installed in DECarray 300 (four RA72s)

Specifications

Physical Characteristics	
Height	106.9 cm (42 in.)
Width	54.7 cm (21.5 in.)
Depth	91.5 cm (36 in.)
Weight	
Empty cabinet	148 kg (327 lb)
RA9x	34 kg (74 lb)
Sx7X	40 kg (89 lb)
TF857	25 kg (56 lb)

Note: Calculate weight of the DECarray 300 family by adding weight of empty cabinet to weight of installed components. Sx7X with two drives is 34 kg (75 lb).

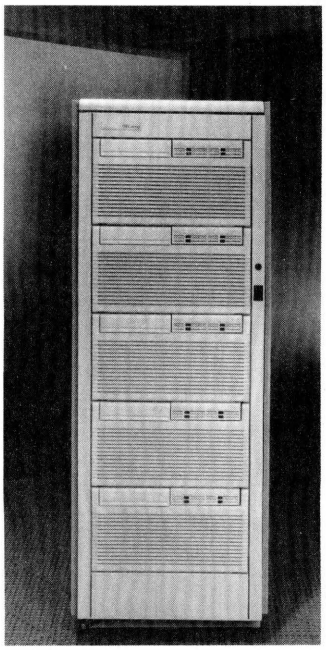
Power Requirements	**120 V**	**240 V**
Number of phases	Single	Single
AC-plug type	NEMA L5-30P	P/N 12-14379-03
Rated current	24 amps	12 amps
RA9x	3.6	1.8
Sx7x	2.22	1.5
Tx857	1.73	0.9

Operating Environment	Class A Operating Environment
Agency compliance	FCC, UL, IEC, CSA, TUEV, and FTZ
Maximum altitude	2438 m (8000 ft)
Relative humidity	40% to 60% noncondensing
Temperature	18° to 24° C (64.4° to 75.2° F)
Disks Supported	**RA70, RA71, RA72, RA90, RA92, RF72, RF73**

Note: See SDI/DSSI Comparison Chart for performance specifications.

Tapes Supported	**TF857, TF867**

SA900 DECarray (SDI)



The SA900 DECarray packs 40 Gbytes of Standard Interconnect series storage into 7.0 square feet. This 170-cm (67-inch) high cabinet offers the flexibility of configuring a variety of up to ten highly competitive half-rack SA7x storage array building blocks (SABBs), RA92 disk drives, ESE50 solid state devices, and TA857 tape subsystems. Less than fully populated SA900 DECarrays are also available. SABBs are preconfigured for upgrading to higher-capacity storage arrays in the field. Storage arrays offer unparalleled data integrity and data availability features that are key in commercial, financial, and realtime data acquisition applications.

Features

- Optimal floor utilization with 40 Gbytes of capacity in a single cabinet
- Flexibility—houses a mix of devices
- Starter configurations allow storage capacity to expand as storage needs grow
- Investment protection—starter entry-level configurations offer flexibility to consolidate existing SA70 SABBs and RA92 and RA90 disk drives into a powerful footprint
- 2000 maximum requests/second (@ 50 ms), fully configured with SA72 SABBs
- 2320 maximum requests/second (@ 100 ms), fully configured with SA72 SABBs
- VAX Volume Shadowing and VAX Disk Striping
- VAXsimPLUS support
- Three-phase power
- One drive per port on any SDI controller or SDI server
- Maximum of 54.6 Gbytes of tape unattended backup within one footprint

Ordering Information

Note: The following table lists the SA900 SDI DECarrays, including their Gbyte capacity and prerequisites. For dual porting: a duplicate set of open ports on an additional SDI controller or I/O server and a duplicate set of BC26V-xx external SDI cables are required.

				Prerequisites				
Order Number	Gbyte Capacity	Number of Components	Space Available for Mix of SA7x/ RA92/ESE/Tape	Number Open Ports	BC26V Cables	VMS Version	HSCxx Software[1]	HSC50 Software
SA900-AA/AD	4.0	1 × SA72-HK	9	4	4	5.4-2	6.0	4.1
SA900-BA/BD	2.8	1 × SA71-HK	9	4	4	5.4-2	6.0	4.1
SA900-CA/CD	1.5	1 × RA92-KA	9	1	1	5.3-1	Note 2	3.9A
SA900-JA/JD	11.2	4 × SA71-HK	6	16	16	5.4-2	6.0	4.1
SA900-KA/KD	16	4 × SA72-HKS	6	16	16	5.4-2	6.0	4.1
SA900-RA/RD	15	10 × RA92	N/A	10	10	5.3-1	Note 3	4.1
SA900-SA/SD	40	10 × SA72	N/A	40	40	5.4-2	6.0	4.1
SA900-TE/TF	8.2	1 × TA857	8	1	1	5.4-2	6.0	4.1
SA900-TG/TH	36.4	2 × TA857	6	2	2	5.4-2	6.0	4.1
SA900-TJ/TK	54.6	3 × TA857	4	3	3	5.4-2	6.0	4.1
SA900-XA/XD	0	–	10	N/A	(For migration program)			
SA900-BA/BB	0	–	10	N/A	(Empty cabinet)			

[1] HSC40/60/70/90 software version
[2] HSC40/50/60 software version
[3] HSC40/60 software version

Cable	Length	Where Used
BC26V-12	12 ft (3.7 m)	One cable connects one RA7x or one RA9x to an existing SDI I/O server or controller.
BC26V-25	25 ft (7.6 m)	
BC26V-50	50 ft (15.2 m)	
BC26V-80	80 ft (24.4 m)	

Note: In the SA900, BC26V-12 (12 ft/3.7 m) cables are suitable for drives located in the bottom rack only. It is recommended that 25-ft (7.6-m) cables or longer be used in all slots of the SA900 storage array.

Configuration Notes

Ordering an SA900 DECarray is similar to ordering multiple CPUs. Order each SA900 as a separate line item. Include the components for that cabinet directly under the SA900 order number.

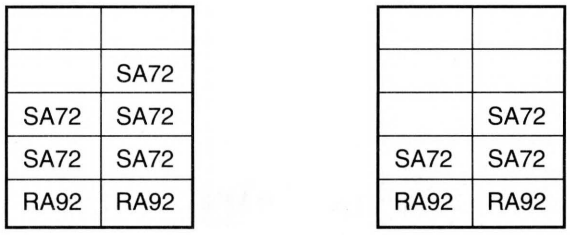
Note: If SA900 is not ordered separately as described above, Digital will follow the default configuration rule: drives for multiple cabinets will be distributed evenly among the cabinets.

For example, if two 120-V, 60-Hz SA900 storage arrays are required—the first with five SA72-HK and two RA92-KA in a single-ported configuration and the second with three SA72-HK and two RA92-KA in a single-ported configuration—the order should specify:

1. (1) SA900-AA (SA900 with one SA72-HK)
2. (4) SA72-HK (SA72 installed in SA900-AA)
3. (2) RA92-KA (RA92 installed in SA900-AA)
4. (22) BC26V-xx (external SDI cables)

5. (1) SA900-AA (SA900 with one SA72-HK)
6. (2) SA72-HK (SA72 installed in SA900-AA)
7. (2) RA92-KA (RA92 installed in SA900-AA)
8. (14) BC26V-xx (external SDI cables

It would be configured as follows.

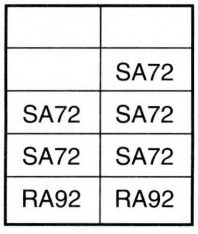


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If a 120-V, 60-Hz SA900 storage array with five SA72-HK and two RA92-KA in a SA900 storage array is required, the order should specify:

1. (1) SA900-AA (SA900 with one SA72-HK)
2. (4) SA72-HK (4-Gbyte SABB)
3. (2) RA92-KA (1.5-Gbyte disk drive)
4. (22) BC26V-xx (external SDI cables)

It would be configured as follows.



BU-3193

If less than fully configured, but greater than starter options are desired, SA71, SA72, and RA92 options can be added to the SA900 in the factory and in the field.

The following table offers **examples** of order numbers required for more storage capacity, e.g., to obtain 6 Gbytes of storage, include one SA900-AA (4 Gbytes), one SA72-GK (1 Gbyte), and one RA72-AF (1 Gbyte). Note that not all possible capacities are listed.

Target Formatted Capacity in Gbytes

Order Number/Capacity (Gbytes)	1.5	2.8	4	6	6	8	10	12	14	15	16	28	40
SA900-AA (4-Gbyte RA72)			1	1		1	1	1	1				
SA900-BA (2.8-Gbyte RA71)		1											
SA900-CA (1.5-Gbyte RA92)	1				1								
SA900-JA (11.2-Gbyte RA71)												1	
SA900-KA (16-Gbyte RA72)											1		
SA900-RA (15-Gbyte RA92)										1			
SA900-SA (40-Gbyte RA72)													1
SA71-HK (2.8-Gbyte RA71)												6	
SA72-GK (1-Gbyte RA72)				1			1		1				
SA72-HK (4-Gbyte RA72)						1	1	2	2				
RA71-AF (700-Mbyte)													
RA72-AF (1-Gbyte)				1			1		1				
RA92-KA (1.5-Gbyte)					3								

Suggested Custom Configurations of the SA900 DECarray

Option	Components	Capacity	Performance I/O requests/ second @ 50 ms	Application
SA900-CA/CD (3) RA92-KA	(4) RA92	6.0 Gbytes	176	Seismic, imaging, engineering
SA900-BA/BD (4) RA92-KA	(1) SA71 (4) RA92	8.8 Gbytes	372	General computing, small office administration timesharing, MIS interactive
SA900-RA/RD	(10) RA92	15.0 Gbytes	440	Image processing, seismic, engineering
SA900-AA/AD (3) SA72-HK	(4) SA72	16.0 Gbytes	800	OLTP realtime, database
SA900-SA/SD	(10) SA72	40.0 Gbytes	2000	Very large database, imaging, seismic, financial

Note: As with all Digital storage subsystems, the SA900 capacity, performance, and data availability can be balanced to meet specific requirements. Digital offers a variety of hardware and software products and capacity planning tools to help configure a subsystem to meet users' needs.

Specifications

Physical Characteristics

Height	170.0 cm (66.94 in.)
Width	61.0 cm (24.0 in.)
Depth	108.0 cm (42.5 in.)
Weight	532.0 kg (1172.0 lb)

Note: Weight represents maximum configuration.

Power Requirements

NEMA receptacle type	L21-30R
IEC receptacle type	309
Number of phases	3

Model	Voltage Nominal V[1]	Frequency Nominal Hz	Current in Amps Steady State					Thermal Dissipation	
			Start[3]	L1	L2	L3	N[4]	Watts	Btu/kJ/h
SA900-AA	120/208	50/60	6.8	0.5	0.0	3.4	3.4	291	993 Btu/h
SA900-AD	240/416	50/60	3.9	0.3	0.0	1.5	1.5	291	1048 kJ/h
SA900-SA	120/208	50/60	27.5	14.0	10.1	10.1	18.0	2460	8396 Btu/h
SA900-SD	240/208	50/60	15.9	6.3	4.5	4.5	9.0	2460	8856 kJ/h

Notes:

1. Currents are for nominal voltages of 120 Vac phase-to-neutral corresponding to 208 Vac phase-to-phase or for 240 Vac phase-to-neutral corresponding to 416 Vac phase-to-phase.
   - 101 and 220 nominal voltages will have proportionately higher phase currents by the ratio of 120/101 or 240/220 to the currents specified in this table.
2. Startup currents are calculated for the worst case power phase.
3. Line and neutral currents are broken down by number, i.e., L1, L2, L3, N. Neutral currents in these products are typically higher than phase currents. It is recommended that neutral site wiring be oversized by 1.7 times that of any one phase.
4. Weight data for all units is approximate and has been rounded up to the nearest 5 pounds.
5. Due to the large variable number of SDI cables the SA900 cabinet can accommodate, the maximum cabinet depth can be 42.50 inches (108 cm), and the minimum cabinet depth can be 34.25 inches (87 cm).
   - This data is typical and calculated for the product at the time of release. It is subject to change without notice.

SA905 Removable DECarray (SDI)

The SA905 (67-inch cabinet) Removable DECarray can house up to 20 full-height 5.25-inch removable RA71-RK, and RA72-RK disk drives. For European markets, there is a 12-drive limit.

Each drive is configured in a canister providing shock and vibration protection, and carrying capabilities. The drives have full DSA/SDI functionality, including dual porting and VAXsimPLUS.

Power and cooling for RA72/RA71-RK 5.25-inch drives are provided by the SA7XR-AK enclosure. The RA72-RK, RA71-RK, and the SA7XR-AK can be factory or field installed in the SA905 DECarray. The SA905 provides capacity for up to 20 RA72 and/or RA71 drives and five SA7XR-AK enclosures. SA905 connects to any of the SDI controllers: HSC90, HSC60, HSC70, HSC50, HSC40, KDM70, KDB50, KDA50, and UDA50.

SA905 Removable DECarray (SDI)
(Continued)

Features

- Removable—easy storage for sensitive data; key locks front door
- Flexibility—two-capacity disk drives (700 Mbytes or 1 Gbyte)
- Static dual porting—increased data availability, no single point of failure
- VAXsimPLUS—preventive maintenance for higher data availability
- RA71/RA72 seek time: 12.5 ms
- Capacity with RA72s (formatted): 20 Gbytes
- Capacity with RA71s (formatted): 14 Gbytes

Ordering Information

Note: SA905 enclosure is a 170-cm (67-inch) DECarray storage cabinet. External BC26V-xx cables must be ordered separately for all drives in a DECarray.

SA905-BA/BD	1.4-Gbyte removable storage starter configuration with two removable RA71-RK drives and one SA7XR-AK full-rack removable enclosure. Space for four additional SA7XR enclosures, (maximum four drives per enclosure) and a maximum of 18 additional RA71-RK and/or RA72-RK removable drives, 120 V, 60 Hz/240 V, 50 Hz. BC26V-xx cables must be ordered separately.
Prerequisite:	Any SDI controller or I/O server.
SA905-AA/AD	Same as above except 2-Gbyte removable storage starter configuration with RA72-RK drives.
SA7XR-AK	Removable full-rack enclosure provides power and cooling for 5.25-inch SDI RA71 and RA72 drives. Maximum of four drives per enclosure. These are to be housed in an SA905. For Q-bus, VAXBI, CI XMI, and UNIBUS systems; 120–240 V, 50–60 Hz.
RA71-RK	700-Mbyte removable 5.25-inch SDI drive enclosed in a canister for installation into an SA7XR-AK removable full-rack enclosure (maximum four drives per enclosure) for power and cooling. These are to be housed in an SA905. For Q-bus, VAXBI, CI XMI, and UNIBUS systems; 120–240 V, 50–60 Hz.
RA72-RK	Same as above except 1-Gbyte removable 5.25-inch SDI drive enclosed in a canister for installation into an SA7XR-AK removable full-rack enclosure.

Cable	Length	Where Used
BC26V-25	25 ft (3.7 m)	One cable connects one RA71, or RA72 to an existing SDI I/O server or controller.
BC26V-50	50 ft (7.6 m)	
BC26V-80	80 ft (24.4 m)	

Specifications

Physical Characteristics	
Height	170.0 cm (66.9 in.)
Width	61.0 cm (24.0 in.)
Depth	108.0 cm (42.5 in.)
Weight	203.0 kg (447 lb)

Note: Weight data is approximate and has been rounded up to the nearest 5 pounds.

Power Requirements	
NEMA receptacle type	L21-30P
IEC receptacle type	309
Number of phases	3

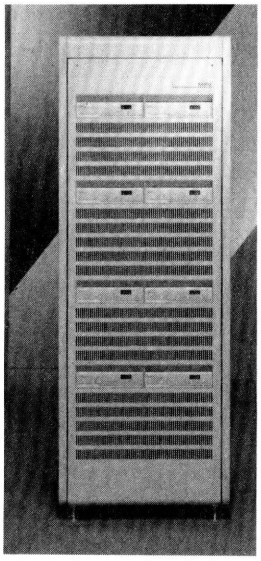
SA905 Removable DECarray (SDI) *(Continued)*

Model	Voltage Nominal V	Frequency Nominal Hz	Current in Amps Steady State					Thermal Dissipation	
			Start	L1	L2	L3	N	Watts	Btu/kJ/h
SA905-AA/BA	120	50/60	6.8	0.5	3.4	0.0	3.4	291	993 Btu/h
SA905-AD/BD	240	50/60	3.9	0.3	1.5	0.0	1.5	291	1048 kJ/h

Notes:
Only minimum and maximum values are presented in above table. This data is typical and calculated for the product at the time of release; it is subject to change without notice.

- Currents are for nominal voltages of 120 Vac phase to neutral corresponding to 208 Vac phase to phase or for 240 Vac phase to neutral corresponding to 416 Vac phase to phase; 101 and 220 nominal voltages will have proportionately higher phase currents by the ratio of 120/101 or 240/220 to the currents specified in this table.
- Startup currents are calculated for the worst case power phase.
- Line and neutral currents are broken down by number, i.e., L1, L2, L3, and N. Neutral currents in these products are typically higher than phase currents. It is recommended that neutral site wiring be oversized by 1.7 times that of any one phase.
- Weight data for all units is approximate and has been rounded up to the nearest 5 pounds.

SA800 Storage Array (SDI)



The SA800 storage array provides between one and eight RA92 disk component drives available in a 1.5-meter (60-inch) cabinet. SA800 storage arrays offer unparalleled data integrity and data availability—features that are key in commercial, financial, and realtime data acquisition applications.

Features

- Capacity (formatted): 12 Gbytes
- Capacity (unformatted*): 15.9 Gbytes
- Maximum requests/s (@ 50 ms): 342
- Maximum requests/s (@ 100 ms): 402†
- Dual access: standard
- VAX VMS Volume Shadowing
- VAXsimPLUS support

* Unformatted capacity provided for comparison purposes; only formatted capacity is user-accessible in any disk drive.

† For symmetrical load balancing. It is recommended that storage arrays be loaded at more conservative levels.

Ordering Information

Note: Open ports on SDI controllers or I/O servers and BC26V external SDI cables are required. For dual porting: One open port on additional SDI controller or I/O server and one additional external **BC26V-xx** cable required for **each** RA92 component drive. SA800 enclosure is a 1.5-meter (60-inch) H9646-SA/SB cabinet.

Order Number	Gbyte Capacity	RA92 Drives	Prerequisites	
			Number of Ports	Number of BC26V Cables
SA800-CA/CD	1.5	1	1	1
SA800-FA/FD	3.0	2	2	2
SA800-HA/HD	6.0	4	4	4
SA800-GA/GD	9.0	6	6	6
SA800-JA/JD	12.0	8	8	8
SA800-LA/LD*	24.0	1	16	16

* Two 1.5-meter (60-inch) H9646-SA/SB cabinets provided.

SA800 Storage Array (SDI)
(Continued)

Cable	Length	Where Used
BC26V-12	12 ft (3.7 m)	One cable connects one RA92 or one RA70 component drive to an existing SDI I/O server or controller.
BC26V-25	25 ft (7.6 m)	
BC26V-50	50 ft (15.2 m)	
BC26V-80	80 ft (24.4 m)	

Specifications

Physical Characteristics

Height	156.2 cm (60.5 in.)
Width	55.9 cm (21.3 in.)
Depth	91.4 cm (36.0 in.)
Weight	470.0 kg (925.0 lb)

Note: Weight represents maximum configuration.

Power Requirements

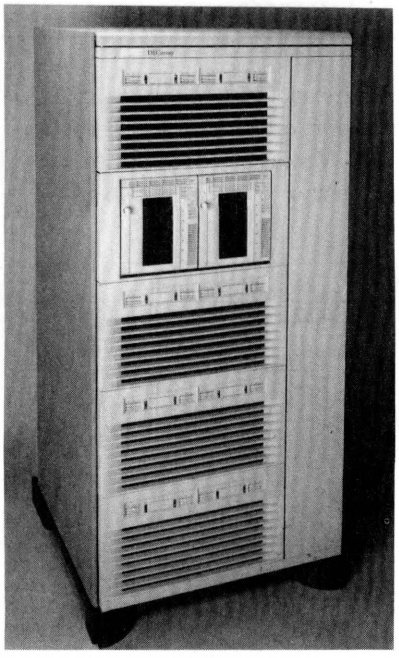
NEMA receptacle type	L21-30R
IEC receptacle type	309
PCS+/PDS+ cable type	BC24W (120/208)
Number of phases	3

Model	Voltage Nominal V	Frequency Nominal Hz	Current in Amps Steady State					Thermal Dissipation	
			Start	L1	L2	L3	N	Watts	Btu/kJ/h
SA800-CA	120/208	60	6.0	3.6	0.0	0.0	3.6	332	1133 Btu/h
SA800-CD	240/416	50	3.6	2.2	0.0	0.0	2.2	333	1199 kJ/h

Notes:
Only minimum and maximum values are presented in above table. This data is typical and calculated for the product at the time of release; it is subject to change without notice.

- Currents are for nominal voltages of 120 Vac phase-to-neutral corresponding to 208 Vac phase-to-phase, or for 240 Vac phase-to-neutral corresponding to 416 Vac phase-to-phase.
- Startup currents are calculated for worst-case power phase.
- Line and neutral currents are broken down by number, i.e., L1, L2, L3, and N. Neutral currents in these products are typically higher than phase currents. It is recommended that neutral site wiring be oversized by 1.7 times that of any one phase.

SF400 DECarray (DSSI)



The SF400 DECarray is Digital's highest capacity DSSI storage array. It supports almost any combination of DSSI storage array building blocks, including the SF72, SF73, and the TF857 tape subsystem within 10 half-rack slots.* For maximum flexibility, these storage products can be installed into any location in the DECarray 400 cabinet.

The DECarray 400's dual power distribution option greatly reduces the possibility of the storage subsystem becoming a single point of failure and allows for greatly enhanced shadow set availability when the individual members of shadow sets are also configured on separate DSSI buses and adapters.

The size of the DECarray 400 cabinet matches the dimensions and physical appearance of the new VAX 7000/10000 platform. This newest member of the Storage Array families provides a variety of packaging options for DSSI storage products. In addition, the DECarray 400 has been designed to the mounting specifications defined for Digital's future storage products.

* Within Q1 the SF35 and TF867 will be installable options for the SF400.

SF400 DECarray (DSSI) *(Continued)*

The following table compares the SF400 DECarray to other DEC storage subsystem products.

	SF100	SF200	SF300	SF400
Maximum disk capacity	10.2 Gbytes	61.3 Gbytes	61.3 Gbytes	102.2 Gbytes
TF857 capacity	18.2 Gbytes	36.4 Gbytes	109.2 Gbytes	72.8 Gbytes
TF867 capacity	42 Gbytes	84 Gbytes	252 Gbytes	126 Gbytes
Maximum SF35s/spindles	1/12	6/72	6/72	10/120
Maximum SF7x/spindles	1/4	6/24	6/24	10/40
Maximum TF8x7 tapes	1	2	6	4

Features

- Over 100 Gbytes of disk capacity, 65 percent more disk capacity than the SF2xx series cabinets.
- Dual power distribution option allows isolated shadow sets in one cabinet
- Up to four TF857 tape subsystems installable in any position within a single cabinet (or four TF867 tape subsystems within Q1)
- 15.2-meter (50-foot) DSSI host interconnect cable

Ordering Information

All SF400s are preconfigured for single-host operation; i.e., they are preconfigured to operate as an end-node on the DSSI bus. Because there is no SF400 bulkhead and no bulkhead to SF/TF internal cable, individual SF73s or SF35s can be easily reconfigured to support multi-host/through-bus DSSI VAXcluster system configurations. Terminators are supplied with the cabinet.

SF400 Dual Power Distribution Upgrades	
SF400-UA/UD	Upgrade to dual power distribution unit, 60 Hz/50 Hz
Custom SF400 DECarray	
SF400-XA/XD	0 Gbyte 10 open slot DSSI cabinet 60 Hz/50 Hz
Preconfigured SF400/SF73 DECarrays	
SF400-BA/BD	4-Gbyte 1 SF73, DSSI 5-high cabinet, 60 Hz/50 Hz
SF400-CA/CD	8-Gbyte 1 SF73, DSSI 5-high cabinet, 60 Hz/50 Hz
SF400-HA/HD	32-Gbyte 4 SF73, DSSI 5-high cabinet, 60 Hz/50 Hz
SF400-JA/JD	48-Gbyte 6 SF73, DSSI 5-high cabinet, 60 Hz/50 Hz
SF400-KA/KD	64-Gbyte 8 SF73, DSSI 5-high cabinet, 60 Hz/50 Hz
Preconfigured SF400/SF35 DECarrays	
SF400-BE/BH	5.1-Gbyte 1 SF35, DSSI 5-high cabinet, 60 Hz/50 Hz
SF400-HE/HH	41-Gbyte 4 SF35, DSSI 5-high cabinet, 60 Hz/50 Hz
SF400-JE/JH	61-Gbyte 6 SF35, DSSI 5-high cabinet, 60 Hz/50 Hz

SF400 DECarray (DSSI) *(Continued)*

SF400 Ordering Tables*

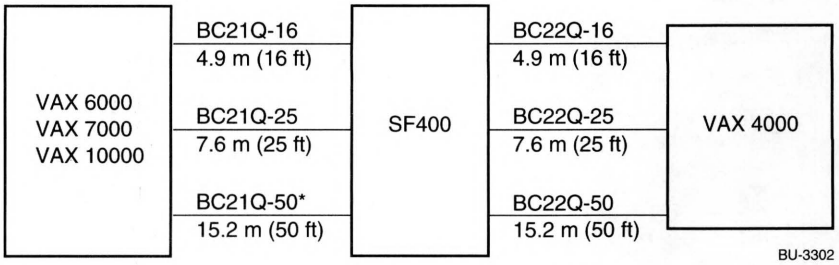
SF73 Storage Required →	Order the following ↓
4 Gbytes	SF400-BA/BD
8 Gbytes	SF400-CA/CD
12 Gbytes	SF400-CA/CD + 1 SF73-HE
16 Gbytes	SF400-CA/CD + 1 SF73-JE
20 Gbytes	SF400-BA/BD + 2 SF73-JEs
24 Gbytes	SF400-CA/CD + 2 SF73-JEs
28 Gbytes	SF400-CA/CD + 2 SF73-JEs + 1 SF73-HE
32 Gbytes	SF400-HA/HD
36 Gbytes	SF400-HA/HD + 1 SF73-HE
40 Gbytes	SF400-HA/HD + 1 SF73-JE
44 Gbytes	SF400-HA/HD + 1 SF73-JE + 1 SF73-HE
48 Gbytes	SF400-JA/JD
52 Gbytes	SF400-JA/JD + 1 SF73-HE
56 Gbytes	SF400-JA/JD + 1 SF73-JE
60 Gbytes	SF400-JA/JD + 1 SF73-JE + 1 SF73-HE
64 Gbytes	SF400-KA/KD
68 Gbytes	SF400-KA/KD + 1 SF73-HE
72 Gbytes	SF400-KA/KD + 1 SF73-JE
76 Gbytes	SF400-KA/KD + 1 SF73-JE + 1 SF73-HE
80 Gbytes	SF400-KA/KD + 2 SF73-JEs

SF35 Storage Required →	Order the following ↓
5.1 Gbytes	SF400-BE/BH
10.2 Gbytes	SF400-XA/XD + 1 SF35-JE
15.3 Gbytes	SF400-BE/BH + 1 SF35-JE
20.4 Gbytes	SF400-XA/XD + 2 SF35-JEs
25.5 Gbytes	SF400-BE/BH + 2 SF35-JEs
30.6 Gbytes	SF400-XA/XD + 3 SF35-JEs
35.7 Gbytes	SF400-BE/BH + 3 SF35-JEs
40.8 Gbytes	SF400-HE/HH
46.0 Gbytes	SF400-HE/HH + 1 SF35-HE
51.1 Gbytes	SF400-HE/HH + 1 SF35-JE
56.2 Gbytes	SF400-HE/HH + 1 SF35-JE + 1 SF35-HE
61.3 Gbytes	SF400-JE/JH
66.4 Gbytes	SF400-JE/JH + 1 SF35-HE
71.5 Gbytes	SF400-JE/JH + 1 SF35-JE
76.6 Gbytes	SF400-JE/JH + 1 SF35-JE + 1 SF35-HE
81.7 Gbytes	SF400-JE/JH + 2 SF35-JEs
86.9 Gbytes	SF400-JE/JH + 2 SF35-JEs + 1 SF35-HE
92.0 Gbytes	SF400-JE/JH + 3 SF35-JEs
97.1 Gbytes	SF400-JE/JH + 3 SF35-JEs + 1 SF35-HE
102.2 Gbytes	SF400-JE/JH + 4 SF35-JEs

* Ordering combinations are not limited to those listed in the SF400 ordering table. For example, one SF72-JE can be substituted for one SF73-HE and two SF72-JEs can be substituted for one SF73-JE, etc. SF73 section of table is broken out in two disk increments; SF35 section is broken out in six disk increments.

SF400 DECarray (DSSI) *(Continued)*

Cabling



*50-foot cables supported in Single-Host/System applications only.

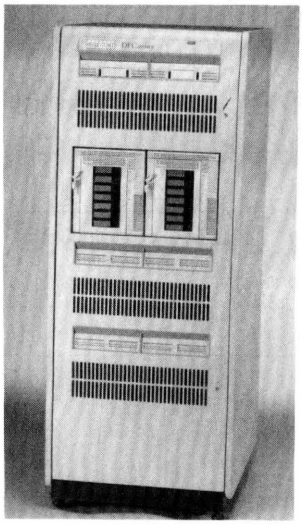
Specifications

Physical Characteristics	
Height	1700 mm (67 inches)
Width	800 mm (31 inches)
Depth	875 mm (34.5 inches)
Weight	544 kg (1200 lb) maximum

Power Requirements	
Voltage (ac)	120/208 Vac and 240/416 Vac
Number of phases	3
AC-plug type	NEMA L21-30P and IEC-309-516P6W
Rated current	24 Amps/phase and 16 Amps/phase

Operating Environment	
Class A operating environment	
Agency compliance	U.L., CSA, TUEV, FCC, VDE
Relative humidity	10% to 85%
Temperature	10° to 40° C (50° to 104° F)
Heat dissipation min/max	4000 watts (13.6 KBtu/Hr), maximum
Non-operating altitude	4900 m (16000 ft) maximum
Operating altitude	2400 m (8000 ft) maximum
Systems supported	VAX 10000, VAX 9000, VAX 7000, VAX 6000, VAX 4000
Disks/tapes supported	SF35, SF73, SF72, TF857, TF867

SF220 DECarray (DSSI)



The SF220 cabinet packages the performance SF35 Storage Array Building Blocks (SABB), the SF72/SF73 capacity SABBs, and TF857 tape subsystems. The configurations thus brought to VAX systems balance performance/capacity and backup in single-system, two-system, and three-system environments. The SF220 fully populated with SF35s provides a maximum capacity of 61.2 Gbytes and a peak throughput capability of 5,256 I/O requests per second.

Features

- Maximum capacity of 61.3 Gbytes (formatted) in a single 1.5-meter-high (60-in.-high) cabinet (5 ft^2 of floor space)
- Maximum 5,256 requests per second (with RF35s) at 100-ms response time
- SABB add-on starter configurations in 1.7-Gbyte increments, with 852-Mbyte easy upgrades
- Supports warm-swap of disk ISEs/TF857s
- Fully DSA compliant
- Upgrade with SF72 or SF73

Ordering Information

Note: The SF220 DECarray subsystem is factory configured to operate as an "end-node" (see Note 2 below) and supported for use with the VAX 10000/9000/7000/6000/4000 and MicroVAX 3xxx (except MicroVAX 3100).

SF220-BA/BD	5.1 Gbytes—six RF35 disks in half-rack, 208-V 60-Hz/416-V 50-Hz three-phase
SF220-CA/CD	10.2 Gbytes—12 RF35 disks in one half-rack, 208-V 60-Hz/416-V 50-Hz three-phase
SF220-FA/FD	20.4 Gbytes—24 RF35 disks in two half-racks, 208-V 60-Hz/416-V 50-Hz three-phase
SF220-HA/HD	30.7 Gbytes—36 RF35 disks in three half-racks, 208-V 60-Hz/416-V 50-Hz three-phase
SF220-JA/JD	61.3 Gbytes—72 RF35 disks in six half-racks, 208-V 60-Hz/416-V 50-Hz three-phase
CK-SF200-L7	15.2-m (50-ft) cable kit for VAX 6000 and VAX 9000 systems
CK-SF200-L8	15.2-m (50-ft) cable kit for VAX 6000 and MicroVAX systems

Configuration Notes

1. Maximum two TF857 magazine tape subsystems can be configured into SF220 storage array. Both can be on the same DSSI bus.
2. All SF220s are cabled for single-host/system or end-node operation; i.e., the SF35s within the SF220 are terminated at the end of each bus. SF220s, configured as is, also support DSSI VAXcluster systems as long as the SF220 is located at the end of the DSSI bus; this requires at least one system to be located in the middle of the bus. One SF220 will support up to 72 RF35s when configured this way.
3. SF220s can be easily re-cabled to support DSSI VAXcluster systems configurations in through-bus mode with the SF220 located in the middle of the DSSI bus. The maximum number of RF35s in any one SF220 that is supported in through-bus mode is 48 because of SF220 bulkhead/connection limitations.

SF220 DECarray (DSSI) *(Continued)*

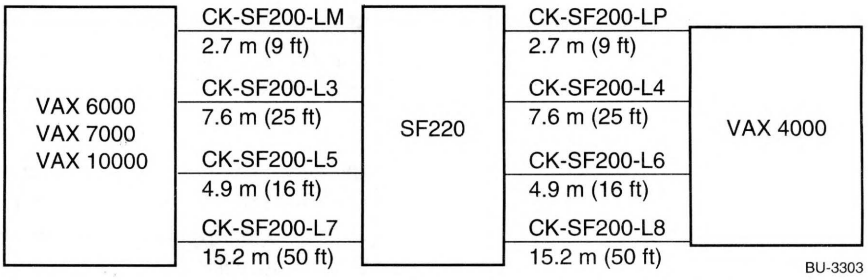
4. SF35s within the SF220 are factory-configured to support two DSSI buses that can each support from one to six RF35s. The SF35 can also be re-configured to support four DSSI buses with one to three RF35s on each DSSI bus.
5. Increase SF220 in one RF35 increment by using SF35-UK expansion kits for SF35-BK/HF half-rack storage arrays. The SF35-BK/HK and SF35-BK/JK and TF857-Ax half-racks come with SF220 internal cabling for connecting with other half-racks.
6. For the number of options required for striping SF220 configuration for VAX 9000 see the table under configuration notes for the SF200/SF210 DECarray storage subsystems. The table is also true for SF220 subsystems.
7. The SF200 supports up to 72 RF35 disks. Refer to the following tables for guidelines on configuring single, dual-host, and tri-host systems with SF35 storage array.

SF220 with SF35s—Single-Host and DSSI VAXcluster Configurations

Number of RF35s			Options Required/System		
Single- and Two-System	Three-System	Four-System[1]	DSSI Adapters XMI[2]	DSSI Adapters Q-bus[3]	DECarray Cable Kits
6	5	4	1	1	1
12	10	8	1	2	2
18	15	12	2	3	3
24	20	16	2	4	4
30	25	20	3		5
36	30	24	3		6
42	35	28	4		7
48	40	32	4		8
54	45	36	5		9
60	50	40	5		10
66	55	44	6		11
72	60	48	6		12

[1] Four-system configuration supported on VAX 6000/7000/10000 only.
[2] VAX 6000/7000/9000/10000; VAX 9000 is single-system only.
[3] VAX 4000 and MicroVAX 3xxx (except MicroVAX 3100).

Cable Kits



CK-SF100-LM/L3/L5 used for all DSSI system-to-system interconnections between VAX 6000, VAX 7000, and VAX 10000.

CK-SF200-LM/L3/L5 can also be used to connect the SF200/SF210/SF220 to the VAX 9000.

Note: Use CK-SF100-LM/L3/L5 to connect the VAX 6000 to the VAX 6000.

CK-SF200-LP/L6 can also be used to connect the SF200/SF210/SF220 to the MicroVAX II and MicroVAX 3xxx (except MicroVAX 3100).

Note: Use CK-SF100-LP to connect the VAX 6000 to the VAX 4000 or to the R400X expander box.

Specifications

Physical Characteristics

Height	153.7 cm (60.5 in.)
Width	61.0 cm (24.0 in.)
Depth	76.2 cm (30.0 in.)
Weight	
Minimum configuration	226 kg (500 lbs)
Maximum configuration	454 kg (1000 lbs)

Power Requirements

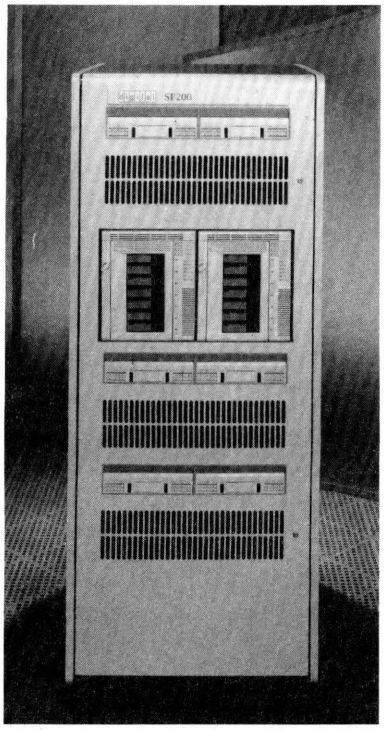
NEMA receptacle type	L21-30R
IEC receptacle type	309516
PCS+/PDS+ cable type	BC24W (120/208)
Number of phases	3

Model	Voltage Nominal V1	Frequency Nominal Hz	Current in Amps Steady State					Thermal Dissipation	
			Start3	L1	L2	L3	N4	Watts	Btu/kJ/h
SF2x0-JA	110/120	60	15.5	6.25	3.28	5.27	8.75	1133	3875 Btu/h
SF2x0-JD	240/416	50	9.3	4.3	2.3	3.65	6.0	1106	3783 kJ/h
SF2x0-TE	110/120	60	1.6	1.3	N/A	N/A	1.3	92	315 Btu/h
SF2x0-TF	240/416	50	1.6	1.0	N/A	N/A	1.0	127	434 kJ/h

Notes:
Only minimum and maximum values are presented in above table. This data is typical and calculated for the product at the time of release; it is subject to change without notice.

- Currents are for nominal voltages of 120 Vac phase-to-neutral corresponding to 208 Vac phase-to-phase, or for 240 Vac phase-to-neutral corresponding to 416 Vac phase-to-phase.
- Startup currents are calculated for worst-case power phase.
- Line and neutral currents are broken down by number, i.e., L1, L2, L3, and N. Neutral currents in these products are typically higher than phase currents. It is recommended that neutral site wiring be oversized by 1.7 times that of any one phase.

SF200/SF210 DECarrays (DSSI)



The SF200/SF210 DECarray storage subsystems bring DSSI technology to the computer room. The SF200/SF72 and SF210/SF73 are supported for use with the VAX 10000, VAX 9000, VAX 7000, VAX 6000, VAX 4000, MicroVAX 3xxx (except MicroVAX 3100), and MicroVAX II systems.

The SF200/SF210 provides from 2 to 48 Gbytes of usable disk storage with the 1-Gbyte RF72 and 2-Gbyte RF73 disk integrated storage elements (ISEs) and up to 36.4 Gbytes of unattended tape backup when two TF857s are included.

The SF200 uses the SF72 (maximum six) storage array building block and the 18.2- Gbyte (formatted) TF857 (maximum two) magazine tape subsystem. The SF72 is a 2- or 4-Gbyte (formatted) half-rack building block within the SF200 and provides incremental capacity, starting as small as 2 Gbytes. Each SF72 is a separately cooled and powered package with two or four RF72 disks. The 4- or 8-Gbyte SF73 (2-Gbyte RF73 component disk ISE) can be added to an SF200 configuration directly from the factory or in the field.

The SF210 uses the SF73 (maximum six) storage array building block and the 18.2-Gbyte (formatted) TF857 (maximum two) magazine tape subsystem. The SF73 is a 4- or 8-Gbyte half-rack building block within the SF210 and provides incremental capacity, starting as small as 4 Gbytes. Each SF73 is a separately cooled and powered package with two or four RF73 disks. The 2-Gbyte or 4-Gbyte SF72 can also be added to the SF210 configuration from the factory or in the field.

The SF200/SF210 can be used to support DSSI VAXcluster systems as well as single-host or striping configurations. The versatility and capacity of the SF200/SF210 allows for the support of one or all three types of configurations at the same time. For example, up to three hosts/systems can be sharing disk and tape ISEs as part of a DSSI VAXcluster system while other hosts/systems are accessing other ISEs within the same SF200/SF210.

The SF200/SF210 offers the flexibility required to take advantage of the fast response time, high QIO/bandwidth, and data availability/integrity characteristics of DSSI VAXcluster systems and configurations.

A single SF200/SF210 can be configured to support up to 14 DSSI buses, providing up to 56 Mbytes/second bandwidth in a DSSI VAXcluster system or single-host configuration or 12 DSSI buses and 48 Mbytes/second bandwidth in striping mode (requires QL-YELA9-xx striping drivers).

Multiple SF200/SF210s containing up to 144 disks (up to 288 Gbytes capacity) can be configured as part of DSSI VAXcluster system and single-host configurations/applications that require large storage capacity.

Features

- Maximum capacity SF200—24 Gbytes (formatted) and 33.6 Gbytes (unformatted), SF210—48 Gbytes (formatted) and 62.4 Gbytes (unformatted) in a single 1.5-meter-high (60-inch-high) cabinet (five square feet of floor space)
- Unattended backup of up to 36.4 Gbytes by optional magazine tape subsystems (two embedded in cabinet)
- Storage array building block starter configurations in 2 Gbytes (SF200) and 4 Gbytes (SF210) formatted, for increments with easy upgrade
- Maximum 1200 requests per second (24 RF72s in an SF200/24 RF73s in an SF210) at 150-ms response time
- Supports warm-swap of disk ISEs/TF857
- VAXsimPLUS support
- Fully DSA compliant
- All single-system configurations can be field-upgraded to two- or three-system DSSI VAXcluster configurations.
- Upgrade with SF72 or SF73

Configuration Notes

1. Maximum two TF857 magazine tape subsystems can be configured into any SF200 or SF210 storage array. Both can be on the same DSSI bus.
2. It is recommended that customers select the SF200/SF210-xA/xD for multi-host/system (as well as single-host) DSSI VAXcluster applications. To do this, the SF200/SF210 must be configured as an end-node and any system used as a middle-node must use the KFMSA-BA/CK-KFMSA-LN adapter/cabinet kit combination (VAX 6000, VAX 7000, VAX 10000) or the VAX 4000 Model 300/500/600 DSSI Bus 1 to connect to adjacent nodes. Utilizing the SF200/SF210 -xA/xD for multi-host/system applications will allow customers to:
   - Maximize the number of RF72/RF73 ISEs (maximum six) per DSSI bus in dual-host/system configurations.
   - Upgrade from single-host/system configurations to multi-host/system configurations without having to reconfigure the SF200/SF210.
3. The SF200/SF210-xE/xH variations will also support two- and three-system DSSI VAXcluster configurations in which host systems are used as end nodes. The SF200/SF210 -xE/xH variations are recommended for striping applications because each SF7x box is preconfigured with two SF7x-to-bulkhead cables.
4. The SF200/SF210 supports up to six RF disks and one tape on a single DSSI bus, or four RF disks and two tapes.
5. All SF200/SF210-xA/xD single-system variants are preconfigured to support up to six RF7x ISEs and one TF857 per DSSI bus.
6. All SF200/SF210-xE/xH DSSI VAXcluster/Striping variants are preconfigured to support up to four RF7x ISEs per DSSI bus.
7. The drives in an SF7x-JK (four RF7x) can be "split" into pairs which then must be connected to different DSSI buses. This is necessary because, in "split mode," the DSSI bus for each pair of drives is terminated in the SF7x storage array. This feature allows an SF210/SF210 to support a maximum of six RF7x drives per bus and 24 RF7x drives on four DSSI buses. The SF7x-HK (2 RF7x) does not have this feature.
8. For SF200/SF210 DSSI VAXcluster configurations with requirements of six RF7x drives per DSSI bus, order one SF7x-HA (two RF7x) per DSSI bus in addition to a preconfigured SF200/SF210. It is important to note that the SF200/SF210 can hold a maximum of six SF7x storage arrays. If the SF7x-HA is upgraded with a SF7x-UK, the SF7x-HA must be connected to another DSSI bus.

Software Support

VAXsimPLUS Support: SF200 supported in current release. SF210 will be supported in a future release of VAXsimPLUS.

- SF200 requires VMS V5.4-2 or later
- SF210 requires VMS V5.5 or later

Ordering Information

Different SF200/SF210 variations can be ordered depending on capacity and application requirements.

To maximize the number of RF72/RF73 ISEs (maximum six) per DSSI bus, it is recommended that customers select SF200/SF210-xA/xD variations for a two-system DSSI VAXcluster (as well as single-system) applications. To do this, the SF200/SF210-xA/xD must be configured as an end node within the DSSI VAXcluster (because of the -xA/xD split-bus/terminated SF72/SF73 feature) and the VAX 6000 or VAX 4000 Model 300/500 system that is used as the middle node must use the VAX 6000 KFMSA-BA/CK-KFMSA-LN adapter/cabinet kit combination or VAX 4000 Model 300/500 DSSI Bus 1 to connect to both end nodes.

The SF200/210-xE/xH variations will also support two-system DSSI VAXcluster systems in which both hosts are end nodes. The SF200/210-xE/xH variations are recommended for three-system DSSI VAXclusters because the -xE/-xH variations are preconfigured in through-bus mode and are recommended for striping applications because each SF7x box comes preconfigured with two SF7x-to-bulkhead cables.

The following tables contain SF200/SF210 ordering information based on capacity and application requirements.

Note: See cable/kitting requirements and configuration notes that follow Ordering Information.

SF200 DECarray

Storage Required	Single-System	DSSI VAXcluster	Striping
2 Gbytes	SF200-BA/BD	SF200-BA/BD or SF200-BE/BH*	SF200-BE/BH
4 Gbytes	SF200-CA/CD	SF200-CA/CD*	SF200-CE/CH
6 Gbytes	SF200-CA/CD + SF72-HK	SF200-CA/CD* + SF72-HK	SF200-CE/CH + SF72-HK
8 Gbytes	SF200-FA/FD	SF200-FA/FD*	SF200-FE/FH
10 Gbytes	SF200-FA/FD + SF72-HK	SF200-FA/FD* + SF72-HK	SF200-FE/FH + SF72-HK
12 Gbytes	SF200-HA/HD	SF200-HA/HD*	SF200-HE/HH
14 Gbytes	SF200-HA/HD + SF72-HK	SF200-HA/HD* + SF72-HK	SF200-HE/HH + SF72-HK
16 Gbytes	SF200-HA/HD + SF72-JK	SF200-HA/HD* + SF72-JK	SF200-HE/HH + SF72-JK
18 Gbytes	SF200-HA/HD + SF72-JK + SF72-HK	SF200-HA/HD* + SF72-JK + SF72-HK	SF200-HE/HH + SF72-JK + SF72-HK
20 Gbytes	SF200-HA/HD + SF72-JK (2)	SF200-HA/HD* + SF72-JK (2)	SF200-HE/HH + SF72-JK (2)
22 Gbytes	SF200-HA/HD + SF72-JK (2) + SF72-HK	SF200-HA/HD* + SF72-JK (2) + SF72-HK	SF200-HE/HH + SF72-JK (2) + SF72-HK
24 Gbytes	SF200-JA/JD	SF200-JA/JD*	SF200-JE/JH
18.2 Gbytes Tape	SF200-TE/TF—can be expanded to include 18.2 Gbytes more tape (add TF857) and up to six SF72s or SF73.		

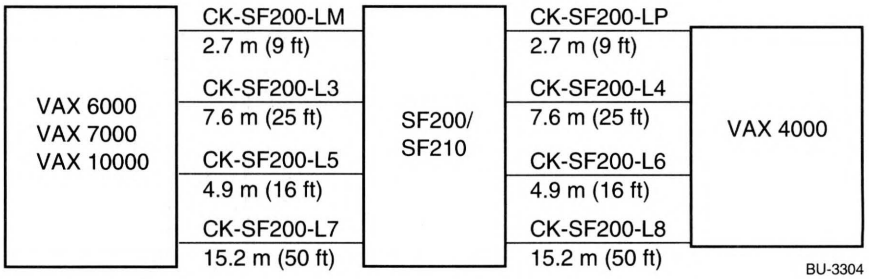
* SF200-xE/xH variations can also be used for multi-host system DSSI VAXcluster applications in which the SF200 is configured as a middle node but will support a maximum of only four RF72 ISEs per bus in dual-host configurations because all SF72s are set up in through-bus mode.

SF210 DECarray

Storage Required	Single-System	DSSI VAXcluster	Striping
4 Gbytes	SF210-BA/BD	SF210-BA/BD or SF210-BE/BF*	SF210-BE/BH
8 Gbytes	SF210-CA/CD	SF210-CA/CD*	SF210-CE/CH
12 Gbytes	SF210-CA/CD + SF73-HK	SF210-CA/CD* + SF73-HK	SF210-CE/CH + SF73-HK
16 Gbytes	SF210-FA/FD	SF210-FA/FD*	SF210-FE/FH
20 Gbytes	SF210-FA/FD + SF73-HK	SF210-FA/FD* + SF73-HK	SF210-FE/FH + SF73-HK
24 Gbytes	SF210-HA/HD	SF210-HA/HD*	SF210-HE/HH
28 Gbytes	SF210-HA/HD + SF73-HK	SF210-HA/HD* + SF73-HK	SF210-HE/HH + SF73-HK
32 Gbytes	SF210-HA/HD + SF73-JK	SF210-HA/HD* + SF73-JK	SF210-HE/HH + SF73-JK
36 Gbytes	SF210-HA/HD + SF73-JK + SF73-HK	SF210-HA/HD* + SF73-JK + SF73-HK	SF210-HE/HH + SF73-JK + SF73-HK
40 Gbytes	SF210-HA/HD + SF73-JK (2)	SF210-HA/HD* + SF73-JK (2)	SF210-HE/HH + SF73-JK (2)
44 Gbytes	SF210-HA/HD + SF73-JK (2) + SF73-HK	SF210-HA/HD* + SF73-JK (2) + SF73-HK	SF210-HE/HH + SF73-JK (2) + SF73-HK
48 Gbytes	SF210-JA/JF	SF210-JA/JF*	SF210-JE/JH

* SF210-xE/xH variations can also be used for multi-host system DSSI VAXcluster applications in which the SF210 is configured as a middle node but will support a maximum of only four RF73 ISEs per bus in dual-host configurations because all SF73s are set up in through-bus mode.

Cable Kits



All CK-SF200-Lx cable kits include 1.7-meter (70-inch) SF200/SF210 internal DSSI cable for connecting SF200/SF210 I/O bulkhead to SF72/SF73 or TF857 building blocks.

CK-SF200-LM/L3/L5 can also be used to connect the SF200/SF210 to the VAX 9000.

Note: Use CK-SF100-LM/L3/L5 for VAX 6000, VAX 7000, VAX 10000 system-to-system DSSI interconnects.

CK-SF200-LP/L4/L6 can also be used to connect the SF200/SF210 to the MicroVAX II and MicroVAX 3xxx (except MicroVAX 3100).

Note: Use CK-SF100-LP to connect the VAX 6000 to the VAX 4000 or to the R400X expander box.

Specifications

Physical Characteristics

Height	153.7 cm (60.5 in.)
Width	61.0 cm (24.0 in.)
Depth	76.2 cm (30.0 in.)
Weight	393.2 kg (865.0 lb)

Note: Weight represents maximum configuration.

Power Requirements

NEMA receptacle type	L21-30R
IEC receptacle type	309516
PCS+/PDS+ cable type	BC24W (120/208)
Number of phases	3

Model	Voltage Nominal V	Frequency Nominal Hz	Current in Amps Steady State					Thermal Dissipation	
			Start	L1	L2	L3	N	Watts	Btu/kJ/h
SF200-JA	110/120	60	15.5	6.25	3.28	5.27	8.75	1133	3875 Btu/h
SF200-JD	240/416	50	9.3	4.3	2.3	3.65	6.0	1106	3783 kJ/h
SF200-TE	110/120	60	1.6	1.3	N/A	N/A	1.3	92	315 Btu/h
SF200-TF	240/416	50	1.6	1.0	N/A	N/A	1.0	127	434 kJ/h
SF210-JA	110/120	60	15.5	6.25	3.28	5.27	8.75	1133	3875 Btu/h
SF210-JD	240/416	50	9.3	4.3	2.3	3.65	6.0	1106	3783 kJ/h
SF210-TE	110/120	60	1.6	1.3	N/A	N/A	1.3	92	315 Btu/h
SF210-TF	240/416	50	1.6	1.0	N/A	N/A	1.0	127	434 kJ/h

Notes:
Only minimum and maximum values are presented in above table. This data is typical and calculated for the product at the time of release; it is subject to change without notice.

- Currents are for nominal voltages of 120 Vac phase-to-neutral corresponding to 208 Vac phase-to-phase, or for 240 Vac phase-to-neutral corresponding to 416 Vac phase-to-phase.
- Startup currents are calculated for worst-case power phase.
- Line and neutral currents are broken down by number, i.e., L1, L2, L3, and N. Neutral currents in these products are typically higher than phase currents. It is recommended that neutral site wiring be oversized by 1.7 times that of any one phase.

SA71/SA72 Storage Array Building Blocks (SDI)

The SA71 and SA72 storage array building blocks (SABBs) each house up to four high-performance, high-reliability 5.25-inch RA71 and RA72 disk drives. These innovative storage devices are designed to maximize performance and capacity, while minimizing footprint and protecting storage investment.

SA71 and SA72 SABBs can be packaged in a 1700-mm (67-inch) high SA900 storage array to provide maximum configurations of 28 Gbytes and 40 Gbytes. An SA900 fully configured with SA72 SABBs provides an industry-leading footprint of 40 Gbytes in 7 square feet.

The SA71 and SA72 can also add capacity and performance to installed SA800, SA850, SA600, SA650, and SA550 storage arrays in the top two slots only. The SABBs can be factory-installed in DECarray 300.

Features	SA71	SA72
• Interface	SDI	SDI
• Capacity (formatted)	2.8 Gbytes	4.0 Gbytes
• Capacity (unformatted*)	3.5 Gbytes	5.1 Gbytes
• Maximum requests/s (@ 50 ms)	196	200
• Maximum requests/s (@ 100 ms)	224	232
• Dual access		
• Performance flexibility		
• VAX VMS Volume Shadowing		
• VAX Disk Striping		
• VAXsimPLUS		

* Unformatted capacity provided for comparison purposes; only formatted capacity is user-accessible in any disk drive. For symmetrical load balancing, it is recommended that storage arrays be loaded at more conservative levels.

Ordering Information

The following table lists the SA71 and SA72 SDI Storage Array Building Blocks (SABB). For dual porting, a duplicate set of open ports on additional SDI controller or I/O servers and a duplicate set of SDI external cables are required. Prerequisite software: VMS V5.4-2, HSC40/60/70/90 software V6.0 and HSC50 software V4.09.

			Prerequisites	
Order Number	Mbyte/Gbyte Capacity	Number Empty Slots	Open Ports	BC26V Cables
Field-Installable for SA550/SA650/SA850 Storage Arrays:				
SA71-CK	700-Mbyte	1	1	1
SA72-CK	1.0-Gbyte	1	1	1
SA71-JK	2.8-Gbyte	1	4	4
SA72-JK	4.0-Gbyte	1	4	4
Field-Installable for SA600/SA800 Storage Arrays:				
SA71-LK	700-Mbyte	1	1	1
SA72-LK	1.0-Gbyte	1	1	1
SA71-MK	2.8-Gbyte	1	4	4
SA72-MK	4.0-Gbyte	1	4	4
Factory-Installable for SX300 Storage Arrays:				
SA71-AK	700-Mbyte	1	1	1
SA72-AK	1.0-Gbyte	1	1	1
SA71-BK	2.8-Gbyte	1	4	4
SA72-BK	4.0-Gbyte	1	4	4

SA71/SA72 Storage Array Building Blocks (SDI) *(Continued)*

Order Number	Mbyte/Gbyte Capacity	Number Empty Slots	Prerequisites: Open Ports	Prerequisites: BC26V Cables
Field-Installable for SA900 Storage Arrays:				
SA71-EK	700-Mbyte	1	1	1
SA72-EK	1.0-Gbyte	1	1	1
SA71-FK	2.8-Gbyte	1	4	4
SA72-FK	4.0-Gbyte	1	4	4
Factory-Installable for SA900 Storage Arrays:				
SA71-GK	700-Mbyte	1	1	1
SA72-GK	1.0-Gbyte	1	1	1
SA71-HK	2.8-Gbyte	1	4	4
SA72-HK	4.0-Gbyte	1	4	4

Cables	Length	Where Used
BC26V-12	12 ft (3.7 m)	One cable connects one RA7x to an existing SDI I/O server or controller.
BC26V-25	25 ft (7.6 m)	
BC26V-50	50 ft (15.2 m)	
BC26V-80	80 ft (24.4 m)	

Note: In the SA900, BC26V-12 (12 ft/3.7 m) cables are suitable for drives located in the bottom rack only. It is recommended that 25 ft (7.6 m) cables or longer be used in all slots of the SA900 storage array.

Specifications

Physical Characteristics

Height	26.56 cm (10.42 in.)
Width	22.19 cm (8.74 in.)
Depth	70.51 cm (27.5 in.)
Weight	27.5 kg (60.0 lb) minimum; 36.0 kg (79.5 lb) maximum

Power Requirements

IEC Receptacle Type	320
PCS+/PDS+ Cable Type	BC26V
Number of Phases	1

Model	Voltage Nominal V	Frequency Nominal Hz	Current in Amps Steady State: Start	L1	L2	L3	N	Thermal Dissipation: Watts	Btu/kJ/h
SA71-AK/CK/EK/GK	120	50/60	2.0	1.1	N/A	N/A	1.1	71.5	244 Btu/h
	240	50/60	1.1	0.6	N/A	N/A	0.6	71.5	257 kJ/h
SA71-BK/JK/FK/HK	120	50/60	6.7	3.3	N/A	N/A	3.3	241	823 Btu/h
	240	50/60	3.9	1.6	N/A	N/A	1.6	241	868 kJ/h
SA72-AK/CK/EK/GK	120	50/60	2.0	1.1	N/A	N/A	1.1	71.5	244 Btu/h
	240	50/60	1.1	0.6	N/A	N/A	0.6	71.5	257 kJ/h
SA72-BK/JK/FK/HK	120	50/60	6.7	3.3	N/A	N/A	3.3	241	823 Btu/h
	240	50/60	3.9	1.6	N/A	N/A	1.6	241	868 kJ/h

SF73/SF72 Storage Array Building Blocks (DSSI)

The SF72 4-Gbyte (formatted) and SF73 8-Gbyte (formatted) storage array building blocks use DSSI ISE technology to provide high capacity and performance in a half-rack. They are suitable for primary local storage or as shared storage within a DSSI VAXcluster configuration.

Two or four disks, each with integral controller, and a multi-track read-ahead cache provide very high throughput. HISPEED mode, selectable on each ISE, substantially reduces access times.

Features	SF72	SF73
Formatted capacity	4-Gbyte	8-Gbyte
Unformatted capacity	8-Gbyte	10.4-Gbyte
Transfer rate	2.0 Mbytes/second	2.0 Mbytes/second
Spiral transfer rate (per ISE)	>1.3 Mbytes/second	>1.3 Mbytes/second
Average access time	21.7 ms	21.3 ms
Average access time high-speed mode	<19.5 ms	<18.3 ms
Read-ahead cache (per ISE)	128-Kbyte	512-Kbyte
Availability/warm-swap	Each ISE has separate power and operator controls and can be replaced without shutting down SF72	Each ISE has separate power and operator controls and can be replaced without shutting down SF73
VAXsimPLUS support	Yes	Yes
VMS support	VMS 5.4-2	VMS 5.5
Fully DSA compliant	Yes	Yes

Additional SF72 Features

- 4-Gbyte (formatted) and 5.6-Gbyte (unformatted) capacity with a 2-Gbyte (formatted) and 2.8-Gbyte (unformatted) entry configuration offered
- Average access time 21.7 ms; < 19.5 ms in HISPEED mode
- Maximum requests per second: 200 per SF72 (four RF72s) at 150 ms response time
- 128-Kbyte read-ahead cache associated with each ISE

Additional SF73 Features

- 8-Gbyte (formatted) and 10.4-Gbyte (unformatted) capacity with a 4-Gbyte (formatted) and 5.2-Gbyte (unformatted) starter configuration
- Average access time 21.3 ms; < 18.3 ms in HISPEED mode
- Maximum requests per second: 200 per SF73 (four RF73) at 150-ms response time
- 512-Kbyte read-ahead cache associated with each ISE

Software Support

VAXsimPLUS Support: SF72 supported in current release. SF73 will be supported in a future release of VAXsimPLUS.

- SF72 requires VMS V5.4-2 or higher for VAX 6000 systems.
- SF72 requires VMS V5.4-1 or higher for VAX 4000 systems.
- SF73 requires VMS V5.5

Ordering Information

SF72 Option	Application (1-Gbyte RF72 ISEs)
SF72-HA	2-Gbyte half-rack embedded in VAX 6000
SF72-HK	2-Gbyte half-rack embedded in SF2x0
SF72-UK	2-Gbyte upgrade expansion kit for SF72-HA or SF72-HK
SF72-JA	4-Gbyte half-rack embedded in VAX 6000
SF72-JK	4-Gbyte half-rack embedded in SF2x0
SF73 Option	**Application (2-Gbyte RF73 ISEs)**
SF73-HA	4-Gbyte half-rack embedded in VAX 6000
SF73-HK	4-Gbyte half-rack embedded in SF2x0
SF73-UK	4-Gbyte upgrade expansion kit for SF73-HA or SF73-HK
SF73-JA	8-Gbyte half-rack embedded in VAX 6000
SF73-JK	8-Gbyte half-rack embedded in SF2x0

Note: When adding the **first** embedded storage devices in the VAX 6000 CPU cabinet **already installed** in the field, the following kit is required.

62X34-UA/UB Door and power controller upgrade kit, 60 Hz/50 Hz

Specifications

Physical Characteristics

Height	26.7 cm (10.5 in.)
Width	22.2 cm (8.75 in.)
Depth	71.1 cm (28.0 in.)
Weight	41.4 kg (91.0 lb)

Note: Weight represents maximum configuration.

Power Requirements

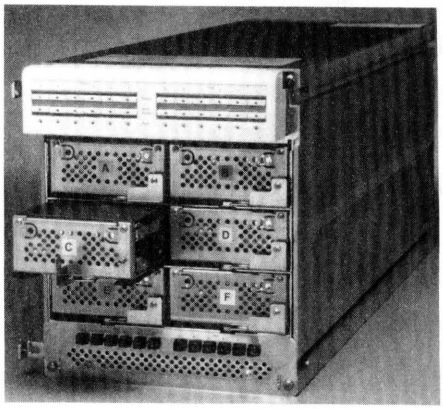
Connector type	IEC-320 (male and female)
Cable type	3-conductor power cord 250 Vac UL recognized and CSA certified
Number of phases	1

Model	Voltage Nominal V	Frequency Nominal Hz	Current in Amps Steady State					Thermal Dissipation	
			Start	L1	L2	L3	N	Watts	Btu/kJ/h
SF72-JK	120	60	5.0	2.0	N/A	N/A	2.0	130	444.6 Btu/h
	240	50	3.0	1.5	N/A	N/A	1.5		
SF73-JA/JK	120	60	5.0	2.0	N/A	N/A	2.0	130	444.6 Btu/h
	240	50	3.0	1.5	N/A	N/A	1.5		

Notes:
This data is typical and calculated for the product at the time of release; it is subject to change without notice.

- Currents are for nominal voltages of 120 Vac phase-to-neutral corresponding to 208 Vac phase-to-phase, or for 240 Vac phase-to-neutral corresponding to 416 Vac phase-to-phase.
- Startup currents are calculated for worst-case power phase.
- Line and neutral currents are broken down by number, i.e., L1, L2, L3, and N. Neutral currents in these products are typically higher than phase currents. It is recommended that neutral site wiring be oversized by 1.7 times that of any one phase.

SF35 Storage Array Building Block (DSSI)



The SF35 storage array is a half-rack building block (SABB) that can house from 2 to 12 of Digital's highest performing DSSI Integrated Storage Element (ISE), the 3.5-inch 852-Mbyte RF35. Each RF35 ISE includes an intelligent controller and Storage Control Protocol (MSCP) server, enabling the SF35 to achieve industry-leading performance that scales linearly as devices are added. Compatible with previous generations of SABBs, the SF35 contains independent power and cooling elements.

Custom configurations of SF35s can be ordered directly for the new SF220 DECarray. Added performance is gained by installing SF35s into the SF200 and SF210 arrays. Individual RF35s are upgradeable into the SF35 as well. An SF220 cabinet, fully populated with SF35s, provides a maximum capacity of 61.2 Gbytes and a peak throughput capability of 5,256 I/O requests per second. The VAX 6000 CPU cabinet can accommodate up to two SF35s; the MicroVAX 3xxx (except 3100), MicroVAX II, and VAX 4000 systems also support the SF35/SF220 DECarray subsystems.

The RF35 is the first 3.5-inch, 5400-rev/min drive available for DSSI, and its unparalleled throughput brings high performance to the mid-range and low-end space.

Features

- Available in multiple DECarray cabinets: SF200, SF210, or SF220 performance storage subsystems
- Single drive upgrades available
- Highest I/O throughput (73 I/O requests per second)
- Warm swap
- Easy removability
- Compact packaging with 3.5-inch form factor

Software Support

Requires VMS V5.5 or later.

Ordering Information

Note: The SF35 is available as an add-on for the SF200, SF210, and SF220.

SF35-BA	1.7 Gbytes—SABB for embedding in VAX 6000 system cabinet, includes half-rack enclosure, integrated disk controllers, two RF35 852-Mbyte disks, internal cabinet cable, mounting hardware, and user documentation
SF35-BK	1.7 Gbytes—Same as above except for SF220, SF210, SF200
SF35-HA	5.1 Gbytes—SABB for embedding in VAX 6000 system cabinet, includes half-rack enclosure, integrated disk controllers, six RF35 852-Mbyte disks, internal cabinet cable, mounting hardware and user documentation
SF35-HK	Same as above except for SF220, SF210, SF200
SF35-JA	10.2 Gbytes—SABB for embedding in VAX 6000 system cabinet, includes half-rack enclosure, integrated disk controllers, 12 RF35 852-Mbyte disks, internal cabinet cable, mounting hardware and user documentation
SF35-JK	Same as above except for SF220, SF210, SF200
SF35-UK	852 Mbytes—Upgrade capacity expansion kit for SF35-Bx/Hx SABB, includes one RF35 852-Mbyte disk disk, mounting hardware, and user documentation

Note: When adding the **first** embedded storage devices in the VAX 6000 CPU cabinet **already installed** in the field, the following kit is required.

62X34-UA/UB	Door and power controller upgrade kit, 60 Hz/50 Hz

Specifications

Physical Characteristics

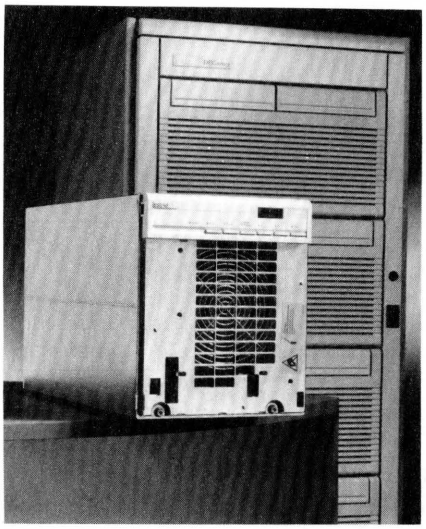
Height	26.7 cm (10.5 in.)
Width	22.2 cm (8.75 in.)
Depth	71.1 cm (28 in.)
Weight (Cabinet only)	SF35-BK: 26 kg (58 lb) SF35-HK: 33 kg (73 lb) SF35-JK: 40 kg (88 lb)

Operating Environment

	2 Drives	12 Drives
Unformatted	2.2 Gbytes	13.2 Gbytes
Formatted	1.7 Gbytes	10.2 Gbytes
Interface	DSSI	DSSI
Disk transfer rate (peak)	6.6 Mbytes second	39.6 Mbytes second
Throughput (I/O per second)	146 I/O per second	876 I/O per second

Note: Although there is complete compatibility among the cabinets for the RF drives, RF35 drives cannot be added into an SF73; RF7x drives cannot be added into an SF35. Partially filled SF35 (BK/HK) options may be upgraded with individual RF35 disks with the SF35-UK option. The configuration and cabling considerations that impact the SF35 in the SF2xx cabinets, and in two-system/three-system DSSI VAXclusters are illustrated in the configuration section of the SF220 section.

ESE50 Solid State Disk



The ESE50 is Digital's fastest Standard Disk Interconnect (SDI) storage system. Using semiconductor technology, the ESE50 eliminates I/O bottlenecks and enables users to achieve maximum system utilization by matching the accelerated power of today's CPUs and VAXclusters with exceptionally fast access to their systems' most time-critical data.

The ESE50 is the same form factor as an RA92 and can be configured in SA900 series storage array cabinets along with additional storage products. It is available in three different capacities: 120 Mbytes, 600 Mbytes and 1 Gbytes. A data retention capability (hard disk, batteries, control logic), which ensures permanent data protection in the event of an ac power loss, is provided with the 120-Mbyte and 600-Mbyte models. In addition, the ESE50 600-Mbyte model incorporates a redundant power supply which provides industry-leading data availability. A 120- to 600-Mbyte upgrade package is available when the need to increment capacity arises.

Superior I/O performance can make a major difference in optimizing the performance of applications in a broad range of industries. From financial trading and telecommunications to retail, pharmaceutical, and scientific environments, the ability to achieve consistently fast access to growing volumes of data is a competitive necessity. Designed to meet this need, the extremely fast access time and I/O per second throughput capabilities of the ESE50 meet the challenge of timely access to the data.

The ESE50 can improve system response time, reduce prolonged batch job runtimes, and allow users to be added without impacting user-level system performance. The ESE50 can reduce system management workload and help expand computing capabilities without adding resources. Its performance boost can also extend the life of inefficiently-coded applications, alleviating the need for expensive application software development.

Features

- Performance—Device access time of 0.25 ms provides the fastest and most consistent access to response-time critical data.
- Capacity—Provides up to 600 Mbytes with integrated data retention—five times that of an ESE20—in a single RA92-sized rack-mountable unit. Up to 1 Gbyte with no data retention.
- Packaging—Packaging in SA900 series storage array cabinets like RA9x/SA7x magnetic drives allows for optimized floor space, power, and HSC controller ports.
- Affordability—Significantly reduced price on entry level models and even greater savings on higher capacity options.
- Availability—Use of industry-leading N+1 power supply component redundency ensures extremely high data availability.

Ordering Information

ESE50-AA/AB	120-Mbyte solid-state disk with integrated data retention, 120 V, 60 Hz/240 V, 50 Hz
ESE50-BA/BB	600-Mbyte solid-state disk with integrated data retention and redundant power supply, 120 V, 60 Hz/240 V, 50 Hz
ESE50-CA	120- to 600-Mbyte upgrade kit consisting of eight 64-Mbyte memory array cards and one power supply module
ESE50-DA/DB	1.0-Gbyte solid-state disk with no data retention functionality, 120 V, 60 Hz/240 V, 50 Hz

Ordering Information
(Continued)

Note: Each ESE50 requires one BC26V cable. If dual porting is required, a duplicate set of cables must be purchased. When packaging an ESE50 in an SA900 storage array, 25 ft. (7.6 m) length cables or greater are recommended.

Option	Length	Where used
BC26V-12	12 ft (3.7 m)	One cable connects one ESE50 to an existing SDI I/O controller
BC26V-25	25 ft (7.6 m)	
BC26V-50	50 ft (15.2 m)	
BC26V-80	80 ft (24.4 m)	

Configuration Notes

Packaging—ESE50 units must be packaged in SA900 series storage array cabinets only. The CK-SA900-L2 installation kit is required (order separately).

Field Installation—All ESE50 options are field installable only. Maximum of four ESE50 units are supported in a single SA900 storage array cabinet.

VMS Support—The ESE50 has been tested under VMS versions V5.4 and V5.5. Specific ESE50 device name recognition support will be provided in a future VMS upgrade release.

Controller Support—ESE50 units are supported on HSC40/60/70/90 controllers with version V6.0 or later microcode and KDM70 controllers running V2.4 or later microcode. Support is unavailable for KDA50, KDB50 or UDA50 controllers.

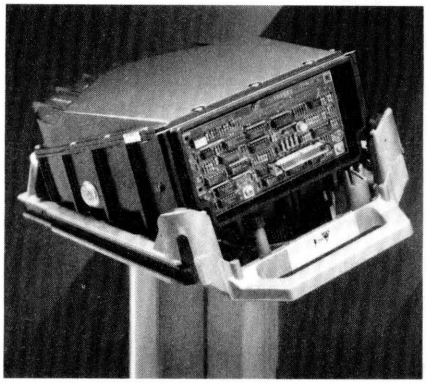
Specifications

Physical Characteristics	
Height	26.5 cm (10.4 in.)
Width	22.2 cm (8.7 in.)
Depth	47 cm (18.5 in.)
Shipping weight	22.7 kg (50 lb)
Installed weight	20.5 kg (45 lb)
Power Requirements	
Standards	UL listed; CSA certified; FCC Class A verified
Voltage	120/208 Vac at 60 Hz; single-phase WYE 220/240 Vac at 50 Hz
Maximum heat dissipation	300 W
Operating Environment	
Temperature range	15° – 32° C (59° – 90° F)
Relative humidity	20% to 80%
Maximum wet bulb	25° C (77° F)
Minimum dew point	2° C (36° F)
Maximum altitude	8,000 ft above sea level
Maximum acoustic noise	45 dBA
Performance	
Maximum throughput	1200 I/O requests per second
Seek time	Not applicable
Average latency	Not applicable
Access time	0.25 ms
Peak transfer rate	2.5 Mbytes/s
Spiral transfer rate	2.0 Mbytes/s
DSA Features	
SDI Ports	2

Data Organization

Formatted Capacity	Sectors (Blocks)	Decimal MB
ESE50-AA/AB	238,080	121.9
ESE50-BA/BB	1,196,544	612.6
ESE50-DA/DB	1,915,392	980.6

RA92 Disk Drive (SDI)



The RA92 is a 9-inch form-factor half-rack SDI device. It is a component drive in the SA800/SA850/SA900 storage array and in the RA92 1-meter (40-inch) cabinet. The RA92 can be configured in any existing SA600/SA650 storage array and in any RA90 1-meter (40-inch) cabinet configuration. It can also be configured in VAX 6000 series system cabinets.

Features

- Capacity: 1.5 Gbytes (formatted); 2 Gbytes (unformatted*)
- Maximum requests/second: 45 (@ 50 ms), 53 (@100 ms†)
- Dual access: standard
- VAX VMS Volume Shadowing
- One drive per port on any SDI controller or SDI server
- VAXsimPLUS support

* Unformatted capacity provided for comparison purposes; only formatted capacity is user-accessible in any disk drive.

† For symmetrical load balancing. It is recommended that storage arrays be loaded at more conservative levels.

Ordering Information

Note: RA92s are 1.5-Gbyte fixed-media disk drives. Open ports on SDI controllers or I/O servers and BC26V external SDI cables are required. For dual porting: One open port on additional SDI controller or I/O server and one additional external BC26V-xx cable required for **each** RA92 component drive.

			Prerequisites		
Order Number	Gbyte Capacity	Number of Drives	Cabinet	Number of Ports	Number of BC26V Cables
RA92-CA/CD[1]	1.5	1		1	1
RA92-FA/FD[1]	3.0	2		2	2
RA92-HA/HD[1]	6.0	4		4	4
RA92-JA/JD[1]	9.0	6		6	6
RA92-KA/LA	1.5	1	SA900	1	1
RA92-NA	1.5	1	SA600/SA650/ SA800/SA850/ RA90/RA92 40-in. cabinet	1	1
RA92-PA[2]	1.5	1	VAX 6000 cabinet DECsystem 5800 cabinet	1	1

[1] Includes 1-meter (40-inch) cabinet with single-phase power; 120 V, 60 Hz/240 V, 50 Hz.

[2] When adding the **first** embedded storage device(s) in the VAX 6000 and DECsystem 5800 CPU cabinet **already installed** in the field, the following kit is required.

62X34-UA	Door and power controller upgrade kit for 60-Hz systems
62X34-UB	Door and power controller upgrade kit for 50-Hz systems

Note: External BC26V-xx cables must be ordered separately for all drives. Each RA92 requires one cable (two if dual porting). See cable options below:

Cables	Length
BC26V-12	12 ft/3.7 m
BC26V-25	25 ft/7.6 m
BC26V-50	50 ft/15.2 m
BC26V-80	80 ft/24.4 m

Specifications

Physical Characteristics

	RA92	RA92 in Cabinet
Height	26.56 cm (10.42 in.)	107.0 cm (42.5 in.)
Width	22.19 cm (8.74 in.)	55.0 cm (21.5 in.)
Depth	68.47 (26.96 in.)	92.0 cm (33.0 in.)
Weight	31.8 kg (70.0 lb)	306.0 kg (680.0 lb)

Note: Weight represents maximum configuration.

Power Requirements

NEMA receptacle type		L5-30R
IEC receptacle type		309
PCS+/PDS+ cable type		BC24S (120)
Number of phases	1	1

Model	Voltage Nominal V	Frequency Nominal Hz	Current in Amps Steady State					Thermal Dissipation	
			Start	L1	L2	L3	N	Watts	Btu/kJ/h
RA92-CA	120	60	5.0	3.4	N/A	N/A	3.4	281	960 Btu/h
RA92-CD	240	50	2.35	1.45	N/A	N/A	1.45	271	976 kJ/h
RA92-JA	120	60	29.9	20.1	N/A	N/A	20.1	1688	5760 Btu/h
RA92-JD	240	50	14.0	8.7	N/A	N/A	8.7	1627	5858 kJ/h
RA92-PA	120	50/60	5.0	3.4	N/A	N/A	3.4	281	960 Btu/h
	240	50/60	3.35	1.45	N/A	N/A	1.45	271	976 kJ/h

Notes:
This data is typical and calculated for the product at the time of release; it is subject to change without notice.

- Currents are for nominal voltages of 120 Vac phase-to-neutral corresponding to 208 Vac phase-to-phase, or for 240 Vac phase-to-neutral corresponding to 416 Vac phase-to-phase.
- Startup currents are calculated for worst-case power phase.
- Line and neutral currents are broken down by number, i.e., L1, L2, L3, and N. Neutral currents in these products are typically higher than phase currents. It is recommended that neutral site wiring be oversized by 1.7 times that of any one phase.
- RA9x and SA70 products are not line-frequency dependent; line frequency must be considered in cabinet products containing RA8x products.

RA71/RA72 Disk Drives (SDI)



The RA7x-series disk drives are the 1.0-Gbyte RA72 and the 700-Mbyte RA71 disk drives. These Digital-manufactured full-height 5.25-inch disk drives are fully DSA/SDI-compliant. The RA72 offers price/performance by providing high-capacity disk storage for mid-range and high-end capacity-intensive applications. The RA71 replaces the RA82 disk drive, reducing the average seek time by 50 percent. It is packaged in 1/8th of the footprint.

The RA7X series of disk drives, packaged in SA7X configurations, represent a competitive, flexible, all-purpose storage solution for datacenter storage needs.

Power and cooling are supplied by the SA7X storage array building block (SABB), a half-rack chassis that houses up to four RA7X component drives. The SA7X SABB is factory or field installed in the SA900 storage array and field installed in all existing SA8XX, SA6XX, and SA550 storage arrays.

RA71/RA72 Disk Drives *(Continued)*

Features	RA71	RA72
• Capacity (formatted)	700 Mbytes	1.0 Gbyte
• Capacity (unformatted*)	874 Mbytes	1.3 Gbytes
• Maximum requests/s (@ 50 ms)	48	50
• Maximum requests/s (@ 100 ms)	56	58
• Media transfer rate (peak):	2.0 Mbytes/s	2.0 Mbytes/s
• Spiral transfer rate (MB/s)	1.255	1.307
• Average seek time	12.5 ms	12.5 ms
• SDI interface		
• Dual access		
• Performance flexibility		
• VAX VMS Volume Shadowing		
• One drive per port on any SDI controller or SDI server		
• VAXsimPLUS support		

* Unformatted capacity provided for comparison purposes; only formatted capacity is user-accessible in any disk drive. For symmetrical load balancing, it is recommended that storage arrays be loaded at more conservative levels.

Ordering Information

All RA7x models are 5.25-inch disk drives installable in SA72/SA71 SABBs, with the following prerequisites:

- SA72-xx or SA71-xx
- One open port on an SDI controller or I/O server
- One BC26V-xx external SDI cable (see Cables that follow)
- For dual porting: one open port on an additional SDI controller or I/O server and one additional BC26V-xx external SDI cable
- VMS Version 5.4-2
- HSC40/60/70/90 Software Version 6.0

RA72-AF/AK	1.0-Gbyte, 5.25-inch disk drive; factory/field installable in SA72/SA71 SABB.
RA71-AF/AK	700-Mbyte, 5.25-inch disk drive; factory/field installable in SA72/SA71 SABB.

Cable	Length	Where Used
BC26V-12	12 ft (3.7 m)	One cable connects one RA7x to an existing SDI I/O server or controller.
BC26V-25	25 ft (7.6 m)	
BC26V-50	50 ft (15.2 m)	
BC26V-80	80 ft (24.4 m)	

Refer to the SA900 cable information for detail on appropriate cable lengths for SA900 configuration.

Specifications

Physical Characteristics	
Height	8.856 cm (3.49 in.)
Width	14.61 cm (5.75 in.)
Depth	20.96 cm (8.25 in.)
Weight	3.0 kg (6.5 lb)

Power Requirements	
Watts	56.6
Thermal dissipation	203 kJ/h (193 Btu/h)

RF-Series Integrated Storage Elements (DSSI)

Digital provides an innovative approach to VAX and DECsystem computer data storage with the RF series of Integrated Storage Elements (ISEs). These DSSI disk storage devices integrate dedicated intelligent controllers within the Winchester disk drives.

The embedded disk controller and MSCP server in the RF ISE increase performance in several ways. They produce close device control, including rotational position sensing, and optimize disk performance through dedicated command execution and queuing. Most importantly, embedded controllers and dedicated bus channels allow multiple RF ISEs to achieve full, simultaneous I/O operation. Overall storage system performance is not compromised by the queuing and communication delays that usually occur when multiple devices share a single controller.

The RF ISE provides increased multidisk performance, similar to large system I/O performance, in cost-effective, compact configurations. This makes the RF ISE an especially appropriate storage solution for performance-oriented, small-cabinet systems.

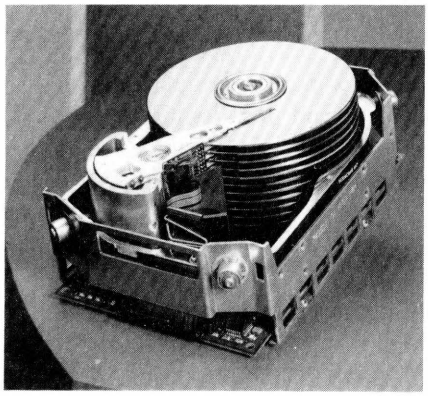
The RF-series are supported by VAXsimPLUS, knowledge-based software that analyzes the number and type of errors recorded by the system, predicts failures, and suggests proactive corrective maintenance to achieve high system availability.

The RF ISE storage solution offers a technology that delivers the performance, data integrity, availability, and flexibility of high-end storage systems in a compact, noise-free ISE. Users can enjoy the advantages of easy, incremental system growth, DSA investment protection, and single-vendor service and support.

Features

- 264-bit error correction code (ECC) per sector and the use of quadruplicate headers
- VLSI components, high-storage density, an embedded servo, and improved packaging ensure unsurpassed reliability
- Support for VMS Volume Shadowing

RF73 Integrated Storage Element (DSSI)



The RF73 is a leading-edge full-height 5.25-inch integrated storage element (ISE). It provides large quantities of bulk storage at the lowest $/mb for those who have reached capacity limits using other products within the DSSI storage family.

Like previous DSSI ISEs, the RF73 contains its own intelligent controller and Storage Control Protocol (MSCP) server, enabling the RF73 to achieve industry-leading performance that scales linearly as devices are added.

Features

- Capacity: 2.0 Gbytes (formatted), 2.6 Gbytes (unformatted)
- Peak transfer rate to DSSI bus: 4.0 Mbytes/s
- Peak transfer rate from disk: 2.7 Mbytes/s
- Average seek time: 12.9 ms
- Average access time: 21.2 ms
- Sustained spiral transfer rate: 2.0 Mbytes/s*
- Read-ahead cache: 11 tracks, 512K
- Throughput: 47 I/Os/s at 100 ms response time
- Power requirements: 1 A @ 5 Vdc; 1.49 A @ 12 Vdc
- Typical power consumption: 23 W

* Note certain combinations of random I/O and transfer size will result in transfer rates significantly higher than the sustained spiral rate of 2.0 Mbytes/s.

Software Support

- Requires VMS V5.5 or later.
- ULTRIX support available in a future release.
- VAXsimPLUS support available in a future release.

Ordering Information

Note: RF73s are 5.25-inch full-height, 2-Gbyte fixed integrated storage elements (ISE).

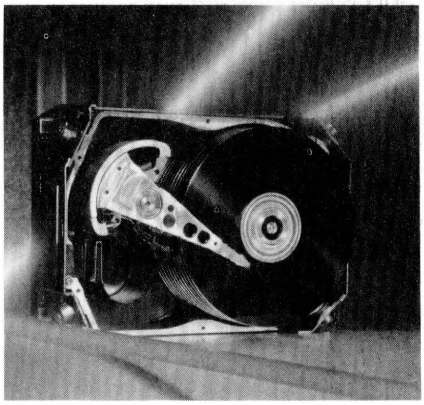
RF73E-AA/AF	RF73 for BA4xx systems and B400X/R400X expansion pedestals. Factory/field installed.
RF73E-SA/SF	RF73 for BA2xx systems and expansion pedestals. Factory/field installed.
RF73-JA	Removable RF73 for VAXft systems and expanders. Factory or field installed.
RF73-KA	Fixed integrated RF73 for VAXft systems and expanders. Factory or field installed.
DL-RF73A-AA	Ten RF73s factory installed in two R400X expansion pedestals for a 20-Gbyte total capacity.
DL-RF73A-A5	Five RF73s factory installed in one R400X expansion pedestal for a 10-Gbyte total capacity.

Specifications

Physical Characteristics

Height	8.25 cm (3.25 inches)
Width	14.7 cm (5.79 inches)
Depth	20.8 cm (8.21 inches)
Weight	2.89 kg (6.36 lb)

RF72 Integrated Storage Elements (DSSI)



The RF72 integrated storage element (ISE) provides increased storage capacity for Q-bus MicroVAX, VAXft, VAX 4000, VAX 6000, VAX 9000, and DECsystem 5500 systems. The RF72 is a leading-edge, full-height, 5.25-inch disk storage device. Each RF72 provides 1 Gbyte of storage capacity. Like the other RF-series the RF72 contains its own controller and MSCP server, bringing state-of-the-art capacity and multi-device performance to the low-midrange systems environment.

The RF72 ISE, combined with the DSSI bus, offers industry-leading data integrity, higher reliability, system and data availability, and provides mainframe class storage for capacity-intensive applications. The RF72 ISE is the storage solution for performance-oriented online transaction processing (OLTP), shop floor control, and other mission-critical applications.

Features

- Capacity: 1 Gbyte (formatted), 1.4 Gbytes (unformatted)
- Media transfer rate (peak): 2.0 Mbytes/second
- Bus peak transfer rate to DSSI: 4.0 Mbytes/second
- Read-ahead cache: 4 tracks, 128K
- Customer data tracks/surface: 1861
- Average seek time: 13.4/10.7 ms in HISPEED mode
- Rotational latency time: 8.3 ms
- Average access time: 21.7 ms
- Data integrity: 264-bits ECC/sector, EDC and parity
- Throughput: 44 I/Os/s (@ 100 ms completion time)

Ordering Information

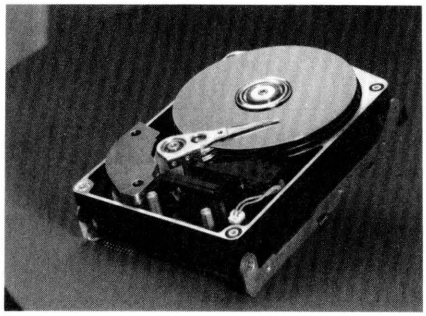
Note: RF72s are 5.25-inch, full-height, 1-Gbyte, fixed-disk, integrated storage elements (ISEs).

RF72E-AA/AF	RF72 for BA4xx systems and B400X/R400X expansion pedestals; factory/field installed.
RF72E-SA/SF	Same as RF72E-AA except for BA2xx systems and expansion pedestals; factory/field installed.
RF72-JA	RF72 removable storage element (RSE) for VAXft systems and expanders; factory or field installed.
RF72-KA	RF72 integrated storage element (ISE) for VAXft systems and expanders; factory or field installed.
DL-RF72A-AA	Ten RF72s factory-installed in two R400X expansion pedestals for a 10-Gbyte total capacity.
DL-RF72A-A5	Five RF72s factory-installed in two R400X expansion pedestals for a 5-Gbyte total capacity.

Specifications

Physical Characteristics	
Height	8.25 cm (3.25 in.)
Width	14.7 cm (5.79 in.)
Depth	20.9 cm (8.21 in.)
Weight	2.57 kg (5.66 lb)

RF35 Integrated Storage Element (DSSI)



The 852-Mbyte RF35 integrated storage element (ISE) provides increased I/O bandwidth performance for VAX 4000 and Q-bus MicroVAX systems. The RF35 ISE is a leading-edge, full-height, 3.5-inch disk storage device. With its integral, dedicated controller, the RF35 ISE adds state-of-the-art single drive performance to the linear increase in system performance achieved when additional ISEs are added to DSSI. The RF35 ISE, combined with the DSSI bus, offers industry-leading 264-bit error correction, higher reliability, system and data availability, and provides maximum bandwidth for I/O intensive applications. The RF35 ISE with DSSI is a full implementation of Digital Storage Architecture (DSA).

With three-system enclosure storage cavities, the system can contain over five Gbytes of disk storage, an I/O bandwidth of 438 I/Os per second, with room available for a tape drive. For applications requiring storage expansion, the RF35 is supported in the R400X expander box. The R400X expansion pedestal can contain up to 13 RF35 ISEs for a total of 11 Gbytes of formatted disk drive storage spread across 13 ISEs, thereby providing highest linear scaleability.

The RF35 offers DSSI integrity and availability features, higher capacity, higher performance, and greater I/O bandwidth, in less physical space, at a lower operating cost. All of these features make the RF35 ISE the storage solution for performance-oriented on line transaction processing (OLTP), shop floor control, and other mission-critical applications.

RF35 ISE *(Continued)*

Features

- Capacity: 852 Mbytes (formatted), 1.1 Gbytes (unformatted)
- Areal density: 128 Mbits/in.
- Peak transfer rate: 3.3 Mbytes/second
- Peak transfer rate to DSSI bus: 4.0 Mbytes/second
- Read-ahead cache: 13 tracks, 512K
- Rotational latency: 5.6 ms
- Average seek time: 9.5 ms; HISPEED mode, 7.5 ms
- Average access time: 15.1 ms; HISPEED mode, 13.1 ms
- Throughput: 73 I/Os per second (100 ms)*
- Spiral transfer: 2100 Kbytes/second
- Data integrity: ECC/EDC/parity
- VAXsimPLUS: Future support
- Control panel: Optional remote

* See Disk Comparison Chart on page 7.5.

Ordering Information

Note: RF35s are 852-Mbyte 3.5-inch full-height fixed disk ISEs.

RF35E-AA/AF	RF35 with DSSI interface for BA4xx based systems and R400X/B400X expanders; factory/field installed.
RF352-AA/AF	Two RF35s with DSSI interface for BA4xx systems and R400X/B400X expanders. Fits in one 5.25-inch storage cavity; factory/field installed.
RF35E-SA/SF	RF35 with DSSI interface for BA2xx based systems and expanders; factory/field installed.
RF35U-AF	RF35 upgrade kit for capacity expansion of RF35E-AA/AF in the field for BA4xx based systems and expanders; cables included.

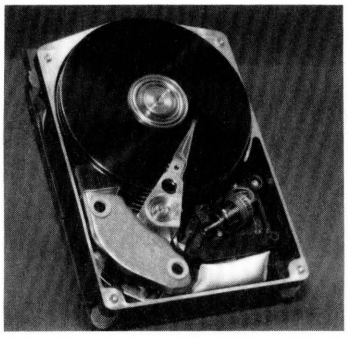
Specifications

Voltage	+5, +12
Weight	0.9 kg (1.9 lbs)

Option	Mounting Requirements	dc Amps @ 5 V	dc Amps @ 12 V	Watts Drawn	Bus Loads Drawn ac	Bus Loads Drawn dc	I/O Panel Insert Size
RF35 (Single drive)	Typical	0.71	2.29	N/A*	(Peak @spinup)		
	Max	0.85	2.55	N/A*	(Peak @spinup)		
	Typical	0.71	0.85	13.8	(Seeking)		
	Max	0.85	0.96	16.5	(Seeking)		

* The first set of +12V figures are transient currents during the first seconds of spinup; power refers more to continuous consumption and does not therefore apply.

RF31T Integrated Storage Element (DSSI)



The RF31T, Digital's fastest DSSI disk drive, is a full-height 3.5-inch ISE designed for VAX 4000 systems and MicroVAX 3xxx systems. Improved performance is achieved by 5400 rev/min, higher areal density, faster access times, and a 512-Kbyte cache buffer. At 381 Mbytes of formatted disk storage, the RF31T is fully compatible with the RF31E; combining the two can provide stripped and shadowed sets.

Fully compliant with previous generations of DSSI ISEs, the RF31T contains its own intelligent controller and Mass Storage Control Protocol (MSCP) server, enabling the RF31T to achieve industry-leading performance that scales linearly as devices are added. End to end data integrity is maintained through 264-bit Error Correction Code, 16-bit Error Detection Code, and bus parity.

RF31T Integrated Storage Element (DSSI) *(Continued)*

Features

- Highest performance DSSI ISE (84 I/O per second at 100 ms completion time)
- 5400 rev/min (5.6 ms rotational latency) for leadership access time (12.5 ms)
- High-speed mode provides 5.5-ms average seek and 11.1-ms average access times
- Fits twice as many spindles in the same physical space for leadership I/O performance/storage compartment (168 I/O per second at 100 ms completion time)
- DSSI storage packs contain either six or 12 drives in one R400X storage expansion pedestal

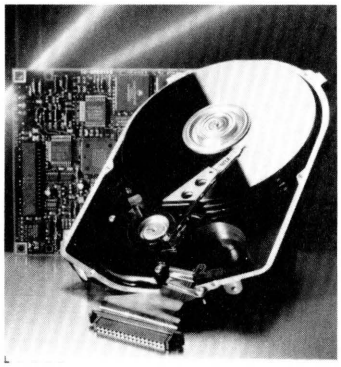
With the RF31T dual ISE, 4 × greater I/O per second over RF31E (5.25-inch) DSSI ISE are acheived in same physical space.

Ordering Information

Note: RF31Ts are 381-Mbyte full-height 3.5-inch DSSI ISEs.

RF31T-AA/AF	RF31T with DSSI interface for BA4xx-based systems and expanders; factory/field installed.
RF312-AA/AF	Two RF31Ts (dual ISE) with DSSI interface for BA4xx-based systems and expanders; factory/field installed.
RF31U-AF	RF31T upgrade kit for capacity expansion of RF31T-AA/AF in the field for BA4xx-based systems and expanders; cables included.
RF31T-SA/SF	RF31T with DSSI interface for BA2xx-based systems and expanders; factory/field installed.
DL-RF31A-A6	Six RF31Ts factory-installed in one R400X expansion pedestal; only available at time of initial system sale.
DL-RF31A-AB	12 RF31Ts factory-installed in one R400X expansion pedestal; only available at time of initial system sale.

RF31 Integrated Storage Element (DSSI)



The RF31 Integrated Storage Element is a 5.25-inch, half-height DSSI device. The RF31 has many performance features not found in the previous generation of ISEs, including error detection code (EDC). EDC is appended to all data and commands entering or leaving the device and bus to provide increased data integrity. The RF31 also features a 4-track, 128-Kbyte look-ahead cache for faster time to data, decreased seek time, parity (end-to-end bus verification of data) for increased data integrity, improved command latency, and increased QIOs/second.

Features

- Formatted capacity: 381 Mbytes
- Average access time: 23.6
- Average seek time: 15.3
- Peak transfer rate: 4.0 Mbytes/second (to bus)
- Cache: 4-track, read-ahead
- Throughput: 41 I/Os/s (at 100 ms response)
- Power (typical): 18.7 watts

Ordering Information

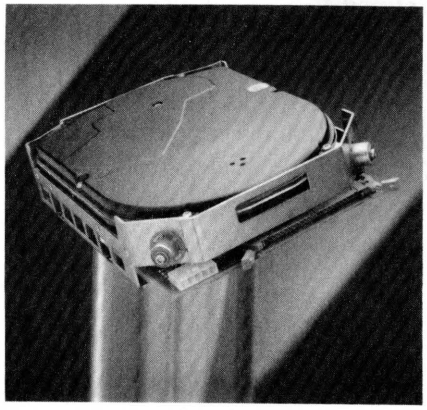
Note: RF31s are 381-Mbyte half-height ISEs.

RF31-JA	RF31 removable storage element (RSE) for VAXft system.
RF31-KA	RF31 integrated storage element (ISE) for VAXft system.
RF31-HA	RF31 integrated storage element (ISE) for VAXft Model 110 system.

Specifications

Physical Characteristics	
Height	4.12 cm (1.62 in.)
Width	14.7 cm (5.79 in.)
Depth	20.9 cm (8.21 in.)
Weight	1.52 kg (3.34 lb)
Voltage	+5, +12

RF31F Integrated Storage Element (DSSI)



The RF31F is a 200-Mbyte, 5.25-inch half-height integrated storage element (ISE) with an embedded DSSI controller. It has all of the benefits of the RF31 along with faster average seek and access times. Utilizing multiple RF31F ISEs allows users high capacity and exceptional performance. The RF31F has been introduced primarily to provide a low-cost, high-performance storage option for Q-bus MicroVAX and VAX 4000 systems. Additionally, it provides customers a replacement for the RF30 while offering 50 additional Mbytes of capacity. The RF31F is fully supported with VMS V5.4-2; it is not currently supported with ULTRIX.

Features

- Formatted capacity: 200 Mbytes
- Average access time: 20.5 ms
- Average seek time: 12.2 ms
- Peak transfer rate to DSSI bus: 4.0 Mbytes/second
- Cache: 4-track, read-ahead
- Throughput: 47 I/Os/s (at 100 ms response)
- Form factor: 5.25-inch, half-height

* The power requirements for the RF31F differ from those of the RF30. See site preparation tables in this chapter.

Ordering Information

RF31F-AA/AF	200-Mbyte, 5.25-inch half-height DSSI ISE for BA4xx-based systems and R400X/B400X expanders; factory/field installed.
RF31F-SA/SF	200-Mbyte, 5.25-inch half-height DSSI ISE for BA2xx/R215F-based systems and expanders; factory/field installed.

Note: See RF-Series Storage Expansion Pedestals Ordering Information for additional information regarding expansion pedestals.

Specifications

Physical Characteristics	
Height	4.12 cm (1.62 in.)
Width	14.7 cm (5.79 in.)
Depth	20.9 cm (8.21 in.)
Weight	1.52 kg (3.34 lb)

Power Requirements

1.3 amps maximum at 5 V
2.21 amps maximum at 12 V (dc only)
Typical power consumption: 18.7 W seeking, 38.0 W spin-up

RF-Series DSSI Storage Expansion Pedestals

The RF-series storage-only expansion pedestals consist of an R215F expansion enclosure that includes one or two RF-series ISEs. The R215F expansion enclosure is a derivative of the BA215 pedestal enclosure. The R215F has the physical capacity for three DSSI ISEs, in any combination.

Ordering Information

R215F (DSSI) expansion enclosure for DSSI-based BA2xx/BA4xx VAX/MicroVAX systems. Includes 2.7-m (9-ft) DSSI cable, H4010-AA kit, and documentation. 120-V power cord included with -DA variants. **Note:** 240-V devices require a country-specific power cord.

	RF31F	RF31	RF72	RF73
1 ISE	**RF31G-DA/DB**	**RF31B-DA/DB**	**RF72B-DA/DB**	**RF73B-DA/DB**
2 ISEs	N/A	N/A	N/A	N/A

R215F (DSSI) expansion enclosure for non-DSSI-based BA200-series systems; includes KFQSA adapter. Includes 2.7-m (9-ft) DSSI cable, H4010-AA kit, and documentation. 120-V power cord included with -xA variants.

	RF31F	RF31	RF72	RF73
1 ISE	**RF31G-CA/CB**	**RF31B-CA/CB**	**RF72B-CA/CB**	**RF73B-CA/CB**
2 ISEs	N/A	N/A	N/A	N/A

R215F (DSSI) expansion enclosure for BA123 system enclosures. Includes KFQSA adapter, 2.7-m (9-ft) DSSI cable, H4010-AA kit, and documentation kit. 120-V power cord included with -BA variants.

	RF31F	RF31	RF72	RF73
1 ISE	**RF31G-BA/BB**	**RF31B-BA/BB**	**RF72B-BA/BB**	**RF73B-BA/BB**
2 ISEs	N/A	N/A	N/A	N/A

R215F (DSSI) expansion enclosure for BA23 system enclosures. Includes KFQSA adapter, 2.7-m (9-ft) DSSI cable, H4010-AA kit, and documentation kit. 120-V power cord included with -AA variants.

	RF31F	RF31	RF72	RF73
1 ISE	**RF31G-AA/AB**	**RF31B-AA/AB**	**RF72B-AA/AB**	**RF73B-AA/AB**
2 ISEs	N/A	N/A	N/A	N/A

The following ISEs are available for any of the expansion enclosures previously referenced.

	RF31F	RF31	RF72	RF73	RF35
Factory Installed	**RF31F-SA**	**RF31E-SA**	**RF72E-SA**	**RF73E-SA**	**RF35E-SA**
Field Installed	**RF31F-SF**	**RF31E-SF**	**RF72E-SF**	**RF73E-SF**	**RF35E-SF**

Power Cords

240-V storage expansion pedestals require a country-specific power cord.

BN19B-2E	U.K./Ireland
BN19J-2E	Australia/New Zealand
BN19N-2E	Italy
BN19Y-2E	Israel
BN19T-2E	India
BN20N-2E	Canada/Japan/United States
BN19L-2E	Denmark
BN19F-2E	Switzerland
BN03B-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, and Spain

RF-Series DSSI Removable Storage Elements

The Removable Storage Element (RSE) is an Integrated Storage Element in a shock-mounted, protective canister. RF-Series RSEs are packaged in the same enclosures as the RZ-Series Removable SCSI Disks. RSEs offer Q-bus systems a high level of security by allowing data to be physically removed from the system, transported to, and stored in a secure location. The RSE, combined with the Digital Storage Systems Interconnect (DSSI), offers system integrity, reliability, and availability. As with the fixed RF-series ISEs, DSSI VAXclusters and Volume Shadowing are supported. RSEs are available for all Q-bus MicroVAX and VAX 4000 systems.

The RSE products offer investment protection in two ways. First, through compatibility with Digital Storage Architecture (DSA), and second, hardware investment is protected by the ability to mix and match all variations of the RSEs in any supported enclosure.

A lockable carrying case is available for protection of the drives during transportation.

Features

- 5.25-inch Winchester disk and integral controller
- Enclosed in protective canister

Prerequisite Software

VMS V5.3 or later

Ordering Information

Note: RSE pedestals for BA4xx and BA2xx enclosures include BC21M DSSI cables and documentation, 120-V power cord, and universal power supply (120/240 V). For 240-V use, a country-specific power cord is required.

	RF31	RF72	RF73
1 RSE in R23RF enclosure*	**RF31B-KA** 381 Mbytes	**RF72B-KA** 1 Gbyte	**RF73B-KA** 2 Gbytes
1 RSE in canister for use in	**RF31-RA** 381 Mbytes	**RF72-RA** 1 Gbyte	**RF73-RA** 2 Gbytes
1 RSE in rackmount chassis*	**2R-RF31R-01** 381 Mbytes	**2R-RF72R-01** 1 Gbyte	**RF73R-KA** 2 Gbytes

* Includes one RSE. Pedestal and rackmount chassis can accommodate two RSEs (order RFxx-RA separately).

RFXX-CK	Carrying case for one removable drive canister.

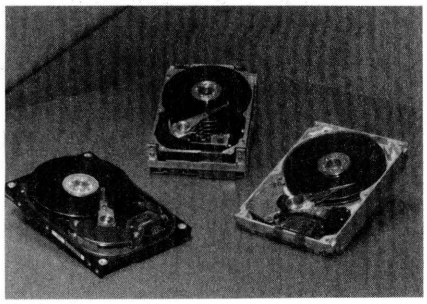
Power Cords

240-V storage expansion pedestals require a country-specific power cord.

BN19P-1K	U.S./Japan/Mexico
BN19H-2E	Australia/New Zealand
BN19A-2E	U.K./Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19Z-2E	Italy
BN19S-2E	India
BN18L-2E	Israel
BN19W-2E	Austria, Belgium, France, Germany, Holland, Norway, Portugal, Spain, Sweden

Note: For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

RZ-Series Disk Drives (SCSI)



The RZ family of SCSI Winchester disk drives consists of both 3.5- and 5.25-inch form factors. Capacities range form 121 to 1380 Mbytes. In addition, the family offers a variety of performance characteristics that can be matched to the system or application environment.

The 3.5-inch RZ23L, RZ24L, and RZ25 drives are typically mounted in the system enclosure of the desktop systems and, depending on the system and its configuration, can provide from 121 Mbytes to 2.1 Gbytes in the system enclosure. The RZ23L, RZ24L, and RZ25 are available in the SZ03 single-drive storage expansion enclosure. The RZ25 is also available in the SZ12 dual-drive storage expansion enclosure.

The 5.25-inch RZ56, RZ57, and RZ58 drives are typically mounted in the SZ12 and SZ16 dual-drive storage expansion enclosures. These drives are also mounted in the system enclosures of the DECsystem 5500 and DECsystem 5900.

With the exception of the DECsystem 5500 and DECsystem 5900 which use only 5.25-inch disks, the RZ23L, RZ24L, RZ25, RZ56, RZ57, and RZ58 may be mixed on systems to provide the required capacity and/or performance.

The following drives are available

- RZ23L—121 Mbytes, suitable for entry level systems or as a swapping disk
- RZ24L—245 Mbytes, an ideal drive for single-user VAXstations
- RZ25—426 Mbytes, ideal for single-user DECstations and entry-level servers
- RZ56—665 Mbytes, suitable for desktop storage expansion
- RZ57—1000 Mbytes, suitable for CAD applications and PC LAN servers
- RZ58—1380 Mbytes, excellent for RISC servers, multimedia, and imaging

RZ26 SCSI Disk Drive

The new RZ26 1.5-Gbyte 3.5-inch SCSI-2 disk drive more than doubles the available capacity for internal system storage on the MicroVAX 3100 Model 30/40/80/90 systems. This device fully incorporates 5.25-inch technology in the 3.5-inch form factor.

Features

The RZ series of 3.5- and 5.25-inch Winchester disk drives offer numerous features that are unique in SCSI disk products.

- Reliability
  - Elevated shock, vibration, and temperature specifications to meet the requirements of an office environment
  - Thorough testing to Digital's SCSI standards for both signal integrity and command conformance

RZ-Series Disk Drives (SCSI)
(Continued)

- Data Integrity
  - 48-bit error correction code (ECC)
  - On power failure, writes-in-progress are completed, thus preventing data loss or corruption
  - 90 percent on-board diagnostic coverage on power-up, for improved fault isolation
  - Write as well as read diagnostics on power-up
  - All errors, hard and soft, are reported to the system to aid in monitoring drive condition
- Performance
  - Drive buffer management optimized to Digital operating systems
  - Drives support overlapped seeking for near-linear incremental performance
- Compatibililty
  - All Digital SCSI disk drives undergo exhaustive system and software regression testing
- Quality Assurance
  - Ongoing testing to assure consistent quality throughout the manufacturing life of the product

Digital's SCSI implementation is documented in *Small Computer System Interface, An Overview* (EK-SCSIS-OV) and *Small Computer System Interface, A Developer's Guide* (EK-SCSIS-SP).

Ordering Information

The following table lists the systems that support RZ56, RZ57, and RZ58 disk drives. See comparison chart on page 7.6.

System	Factory Installed	Add-on	Installation
VAXstation 3520/3540		**RZ56-SF**	Field installed
For addition to SZ12/RZ5x expansion boxes		**RZ56-UK**	Customer installable
		RZ57-UK	Customer installable
		RZ58-UK	Customer installable
For addition to SZ16 expansion box		**RZ56-UL**	Customer installable
		RZ57-UL	Customer installable
		RZ58-UL	Customer installable
DECsystem 5500 (BA4xx series enclosures)	**RZ56E-AA**	**RZ56E-AF**	Field installed
	RZ57E-AA	**RZ57E-AF**	Field installed
	RZ58E-AA	**RZ58E-AF**	Field installed
DECsystem 5900	**RZ57-LF**	**RZ57-LG**	Field installed
	RZ58-LF	**RZ58-LG**	Field installed

Note: See SZ12/SZ16 description in this chapter for RZ56, RZ57, and RZ58 drives in expansion boxes.

Ordering Information
(Continued)

The following table lists the systems that support the RZ23L, RZ24L, and RZ25 drives. Each drive can be factory installed with diskless systems (see respective system menus for maximum quantity allowed) or installed as an add-on at the customer site. See comparison chart on page 7.6.

Base Drives: RZ23L 121-Mbyte, 3.5-inch SCSI fixed-disk drive
RZ24L 245-Mbyte, 3.5-inch SCSI fixed-disk drive
RZ25 426-Mbyte, 3.5-inch SCSI fixed-disk drive

System	Factory Installed	Add-on	Installation
VAXstation 4000 VLC	**RZ23L-EJ**	**RZ23L-EH**	Customer installable
	RZ24L-ES	**RZ24L-ER**	Customer installable
VAXstation 4000 Model 60	**RZ23L-EM**	**RZ23L-EL**	Customer installable
	RZ24L-EM	**RZ24L-EL**	Customer installable
	RZ25-EM	**RZ25-EL**	Customer installable
VAXstation 3100 Model 30/40/48		**RZ23L-EF**	Field installed
		RZ24L-EF	Field installed
		RZ25-EH	Field installed
VAXstation 3100 Model 38/76		**RZ23L-EH**	Field installed
		RZ24L-EH	Field installed
		RZ25-EH	Field installed
MicroVAX 3100 Models 10e/20e	**RZ23L-EG**	**RZ23L-EF**	Field installed
	RZ24L-EG	**RZ24L-EF**	Field installed
MicroVAX 3100 Models 30/40/80/90	**RZ23L-EJ**	**RZ23L-EH**	Field installed
	RZ24L-EJ	**RZ24L-EH**	Field installed
	RZ25-EN	**RZ25-EK**	Field installed
	RZ26-EN	**RZ26-EK**	Field installed
DECstation 5000 Model 20/25 DECsystem 5000 Model 25	**RZ23L-FM**	**RZ23L-FN**	Customer installable
	RZ24L-FM	**RZ24L-FN**	Customer installable
	RZ25-FM	**RZ25-FN**	Customer installable
DECstation 5000 Model 100 Series DECsystem 5000 Model 133	**RZ23L-FM**	**RZ23L-FL**	Customer installable
	RZ24L-FM	**RZ24L-FL**	Customer installable
	RZ25-FM	**RZ25-FL**	Customer installable
DECstation 5000 3100/2100	**RZ23L-FG**	**RZ23L-FG**	Field installed
	RZ24L-FG		Field installed
DECstation/ DECsystem 5000 Model 200/240, DECsystem 3100	N/A	N/A	N/A
DECsystem 5100		**RZ25-EF**	Field installed
applicationDEC 433	**RZ24L-SJ**	**RZ24L-SH**	Customer installable
	RZ25-SJ	**RZ25-SH**	Customer installable

Power Cords

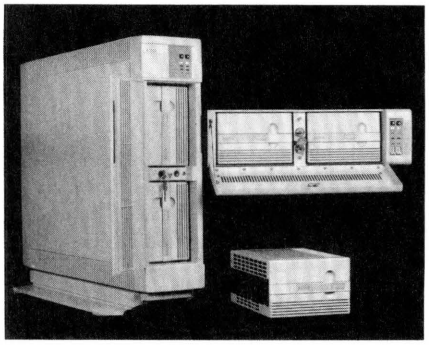
A power cord is required for each 220/230/240-V RZ device ordered.

BN19A-2E	U.K./Ireland
BN19D-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN19N-2E	Italy
BN19S-2E	India
BN19U-2E	Israel

Specifications

See the SCSI comparison chart on page 7.6.

RZ-Series Removable Disks (SCSI)



The Removable SCSI Disks (RSDs) are 5.25-inch Winchester disks in shock-mounted, protective canisters, with the same features and functionalities as their fixed RZxx SCSI drive counterparts, with the added benefit of removability. The RSD products provide the ideal solution for SCSI workstation and entry-level system users with applications requiring data security, transportability, and high availability.

The RSDs are available in three capacities, based on the RZ55 (332 Mbytes), the RZ56 (665 Mbytes), and the RZ57 (1.0 Gbyte), and can be ordered in either an R23RZ pedestal similar in style to a BA23 enclosure, or in a rackmount chassis compatible with any 19-inch EIA-type cabinet.

The canister remains the same regardless of the drive type, allowing all of the SCSI RSDs to be interchangeable. It also features a retractable handle for ease of insertion and portability.

A lockable carrying case is available for protection of the disk during transportation.

Features

- 5.25-inch Winchester disk enclosed in protective canister
- Pedestal or rackmount configuration
- Pedestal and rackmount chassis each house up to two canisters
- Interchangeable canister. **Note:** Not interchangeable with custom tabletop SCSI removable canisters or RF-series removables for DSSI.
- Connect up to six RSDs on any single SCSI-bus system

	RZ55	RZ56	RZ57
Capacity (formatted)	332 Mbytes	665 Mbytes	1.0 Gbyte
Transfer rate	1.25 MB/s	1.87 MB/s	2.2 MB/s
Seek time	16 ms	16 ms	14.5 ms
Access time	24.3 ms	24.3 ms	<23 ms

Prerequisite Software

VMS V5.0 or later
VMS V5.4 or later for Volume Shadowing
ULTRIX V4.1 and later (cold swap support only)

Ordering Information

	RZ55	RZ56	RZ57
One RSD in R23RZ pedestal enclosure with space for one additional	**RZ55B-KA**	**RZ56B-KA**	**RZ57B-KA**
One RSD in rackmount chassis with space for one additional	**RZ55R-KA**	**RZ56R-KA**	**RZ57R-KA**
One add-on RSD in canister	**RZ55-RA**	**RZ56-RA**	**RZ57-RA**

RFXX-CK	Carrying case for one removable canister

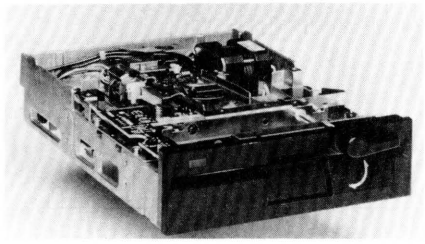
Power Cords

Included with enclosures is a universal power supply (120/240 V). For 240-V use, a country-specific power cord is required.

BN19P-1K	U.S./Japan/Mexico
BN19H-2E	Australia, New Zealand
BN19W-2E	Austria, Belgium, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19A-2E	U.K./Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19Z-2E	Italy
BN19S-2E	India
BN18L-2E	Israel

Note: For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

RX33 Flexible Diskette Drive (SCSI)



The RX33 is a half-height, 5.25-inch 1.2-Mbyte diskette drive. In high-density mode, the drive provides industry-standard compatibility utilizing double-sided high-density diskettes. This allows customers access to a vast software base of industry media. In BA23 configurations, the RX33 can go into standard mode allowing users to read and write RX50-type standard-density diskettes on a single side. This dual-mode capability allows Digital customers to access a vast software base without sacrificing RX50 software compatibility. The RX33 is offered in the SZ12 expansion box for use with Digital's desktop systems. In this SCSI configuration, support of the RX50 mode is not available—access to the industry-standard software base is fully supported.

Features

- Formatted capacity per diskette: 1.2 Mbytes
- Peak transfer rate: 500 Kbytes/second
- Average seek time: 92 ms
- Average rotational latency: 83 ms
- Bytes per sector: 512
- Sectors per track: 15
- Tracks per diskette: 160
- Brushless direct drive dc motor
- Dynamic media clamping
- Diskette ejection mechanism
- "Diskette changed" detection device

Ordering Information

Note: RX33s are 1.2-Mbyte diskette drives.

RX33A-AA	RX33 with cables, for use in BA23 enclosure (drive 1)
RX33A-BA	RX33 with cables, for use in BA123 enclosure (drive 1)
RX33-AS	RX33 for use in applicationDEC 433
RX33-UK	RX33 upgrade kit for SZ12/RZ5X expansion box
RX33K-10	Pack of ten RX33s

Note: See SZ12 description in this chapter for RX33 included in SZ12 dual-drive expansion box.

Configuring Information

Option	dc Amps Drawn at		Watts Drawn
	5 V	12 V	
RX33	0.35	0.22	4.40

RX26 Flexible Diskette Drive (SCSI)

The RX26 flexible diskette drive is designed for high-capacity floppy-disk storage for desktop systems. It provides 2.8 Mbytes of formatted storage capacity (4 Mbytes unformatted) in a compact 3.5-inch form factor. Utilizing industry-standard 3.5-inch microfloppy diskettes, the RX26 adds a third level to the existing industry diskette structure of 0.7 Mbyte and 1.4 Mbytes, formatted (1 Mbyte and 2 Mbytes unformatted, respectively).

It is fully backward compatible on both read and write capabilities with the RX23 3.5-inch media at both 0.7-Mbyte and 1.4-Mbyte capacities. This important feature provides users with access to the complete range of industry-standard software published on 3.5-inch microfloppies. The RX26 may be operated in these modes as well. The RX26 employs the industry-standard FDD interface.

The RX26 is offered in the VAXstation 4000 Model 60/90 workstations, the SZ03 expansion box, and MicroVAX 3100 Models 30/40/80/90.

RX26 Flexible Diskette Drive *(Continued)*

Features

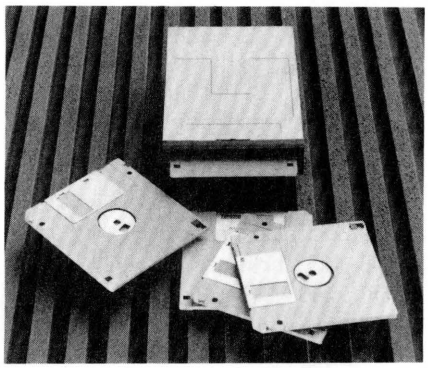
- Formatted capacity per diskette: 2.8 Mbytes (2 Mbytes unformatted)
- Peak transfer rate: 1-Mbyte/second (in 2.8/4-Mbyte mode)
- Average seek time: 95 ms
- Average rotational latency: 100 ms
- Sectors per track: 36
- Tracks per diskette: 160

Ordering Information

	VAXstation 4000 Models 60/90	VAX 4000 Model 100 MicroVAX 3100 Models 30/40/80/90	DECstation 5000 Models 20/25/33	DECsystem 5900
Factory	RX26-ES	RX26-EN	RX26-FP	RX26-LF
Field	RX26-UL	RX26-EL	RX26-FN	RX26-LG

RX26K-10	Pack of ten 2.8-Mbyte 3.5-inch flexible diskettes

RX23 Flexible Diskette Drive (SCSI)



The RX23 flexible diskette drive provides a convenient removable storage for desktop systems. It features exceptional storage capacity and functionality in a highly compact, 3.5-inch form factor.

The RX23 drive utilizes industry-standard 3.5-inch microfloppy diskettes. Industry diskettes are currently offered in two standard capacities: 2.0-Mbyte, high-density floppies (1.4-Mbyte formatted), and 1.0-Mbyte, standard-density floppies (700-Kbyte formatted). The RX23 drive will read and write to the high-density media while providing read-only compatibility with the standard-density media. This dual mode capability provides users with access to the complete range of industry-standard software published on 3.5-inch microfloppies.

The RX23 is offered in most Digital desktop systems as well as in the SZ12 dual-drive expansion box.

Features

- Formatted capacity per diskette: 1.4 Mbytes
- Peak transfer rate: 500 Kbytes/second
- Average seek time: 94 ms
- Rotational latency (average): 100 ms
- Sectors per track: 18
- Tracks per diskette: 160
- Operating current consumption: 0.22 A @ 5.00 Vdc (typical)

Ordering Information

	VAXstation 3100 Model 30	VAXstation 3100 Model 38	VAXstation 3100 Model 76	MicroVAX 3100 Model 10e	MicroVAX 3100 Model 20e	DECstation 2100/3100	DECsystem 5100	DECstation 5000 Series 100
Factory Installed	RX23-EJ	RX23-EJ	RX23-ER	RX23-ET	RX23-EM	RX23-EJ	RX23-EM	RX23-FM
Field Installed	RX23-EH	RX23-EH		RX23-EP	RX23-EK	RX23-EZ	RX23-EK (includes drive plate)	RX23-FL

RX23-UK	1.44-Mbyte 3.5-inch diskette drive upgrade kit for SZ12/RZ5X expansion box.
RX23K-10	Pack of ten 1.44-Mbyte 3.5-inch flexible diskettes.

Note: See SZ12 description in this chapter for RX23 included in SZ12 dual-drive expansion box.

SZ03/SZ12/SZ16 Expansion Boxes

Power Cords for SZ03, SZ12, and SZ16 expansion boxes

120-V expansion boxes include power cord. Expansion boxes for 240-V systems require a country-specific power cord.

BN19K-2E	Denmark
BN19W-2E	Austria, Belgium, Finland, France, German, Holland, Norway, Portugal, Spain, Sweden
BN19P-1K	U.S./Canada/Mexico
BN19U-2E	Israel
BN19Z-2E	Italy
BN19E-2E	Switzerland
BN19A-2E	U.K./Ireland
BN19H-2E	Australia/New Zealand

SZ03 Expansion Box

SZ03 expansion boxes are supported on the following systems: DECstation 5000 series, DECsystem 5000 series, and VAXstation 4000 series.

- The SZ03 tabletop expansion box supports one 3.5-inch half-height device.
- 120-V expansion boxes include power cord; order power cord for 240-V variants.

SZ03A-AA/AB	2.8-Mbyte RX26 diskette drive
SZ03B-AA/AB	121-Mbyte RZ23L disk drive
SZ03B-BC/BD	245-Mbyte RZ24L disk drive
SZ03B-CA/CB	426-Mbyte RZ25 disk drive
RRD42-FA/DG	600-Mbyte RRD42 compact disc drive

SZ12 Expansion Box

The SZ12 expansion box is a dual-drive enclosure used to house SCSI storage drives. SZ12 expansion box configurations and upgrade kits are supported on the following systems: DECstation 5000, 3100, 2100, DECsystem 5100, 5000, VAXstation 3100, 4000, and MicroVAX 3100 systems.

Ordering Information Configuration Rules

- The SZ12 expansion box supports a maximum of two 5.25-inch full-height disk drives, or one 5.25-inch full-height disk drive and one removable media device (diskette, tape, or compact discs).
- Maximum of three SZ12 expansion boxes (six storage drives) supported on one SCSI controller, with maximum of one internal drive.
- 120-V expansion boxes include power cord; order power cord for 240-V variants.
- SZ12 expansion box is customer installable.

SZ12 Dual-Drive Expansion Boxes

Order Number	Disk Drives					Diskette Drives		Tape Drives		Compact Disk Drives
	RZ25 426-MB	RZ55 332-MB	RZ56 665-MB	RZ57 1.0-GB	RZ58 1.38-GB	RX23 1.44-MB	RX33 1.2-MB	TZ30 95-MB	TZK10 525-MB	RRD42 600-MB
SZ12A-XA/XB		1								
SZ12A-AA/AB		2								
SZ12A-LA/LB		1				1				
SZ12A-MA/MB		1					1			
SZ12A-HA/HB		1						1		
SZ12A-EA/EB		1							1	

SZ12 Dual-Drive Expansion Boxes *(Continued)*

Order Number	Disk Drives					Diskette Drives		Tape Drives		Compact Disk Drives
	RZ25 426-MB	RZ55 332-MB	RZ56 665-MB	RZ57 1.0-GB	RZ58 1.38-GB	RX23 1.44-MB	RX33 1.2-MB	TZ30 95-MB	TZK10 525-MB	RRD42 600-MB
SZ12A-FA/FB		1								1
SZ12B-XA/XB			1							
SZ12B-BA/BB			2							
SZ12B-HA/HB			1					1		
SZ12B-EA/EB			1						1	
SZ12B-FA/FB			1							1
SZ12C-XA/XB				1						
SZ12C-CA/CB				2						
SZ12C-EA/EB				1					1	
SZ12C-FA/FB				1						1
SZ12G-XA/XB	1									
SZ12G-GA/GB	2									
SZ12G-HA/HB	1							1		
SZ12G-EA/EB	1								1	
SZ12G-FA/FB	1									1
SZ12J-XA/XB					1					
SZ12J-JA/JB					2					
SZ12J-EA/EB					1				1	
SZ12J-FA/FB					1					1
SZ12X-LA/LB						1				
SZ12X-MA/MB							1			
SZ12X-HA/HB								1		
SZ12X-EA/EB									1	

Note: If the required storage combinations are not offered above, order the single-drive SZ12 configuration plus an upgrade kit; see following page.

SZ12 Upgrade Kit Configuration Rules

- One free storage cavity must be available to house the upgrade kit.
- SZ12 upgrade kits can be used with existing RZ5X expansion boxes.
- Upgrade kits are customer installable.

Order Number	Disk Drives				Diskette Drives		Tape Drives		Compact Disk Drives
	RZ25 426-MB	RZ55 332-MB	RZ56 665-MB	RZ57 1.0-GB	RX23 1.44-MB	RX33 1.2-MB	TZ30 95-MB	TZK10 525-MB	RRD42 600-MB
RZ25-UK	1								
RZ55-UK		1							
RZ56-UK			1						
RZ57-UK				1					
RX23-UK					1				
RX33-UK						1			
TZ30-UK							1		
TZK10-UK								1	
RRD42-UK									1

SZ16 Expansion Box

SZ16 expansion boxes and upgrade kits are supported on the following systems: DECstation 5000 series, 3100, 2100; DECsystem 5100, 5000, and VAXstation 4000

Ordering Information

Configuration Rules

- The SZ16 expansion box supports a maximum of two 5.25-inch full-height disk drives, or one 5.25-inch full-height disk and two half-height removable media devices. Supported removable media combinations are:
  - Two RRD42 compact disk drives
  - One TZ30 tape, or TLZ06 tape plus RRD42 compact disc drive
  - One TZK10 tape, or TLZ06 tape plux RRD42 compact disc drive
- Installation of two half-height removable media devices requires hardware bracket kit (BA46X-AB)
- Maximum of three SZ12 expansion boxes (six storage drives) supported on one SCSI controller, with maximum of one internal drive.
- 120-V expansion boxes include power cord; order power cord for 240-V variants.

Note: DECsystem and DECstation 5000 series require a terminator

H8574-A SCSI Terminator

Note: A combination of one TZ30 and one TZK10 is NOT supported

Order Number	Disk Drives			Tape Drives			Compact Disk Drives
	RZ56 665-MB Full-Height	**RZ57** 1.0-GB Full-Height	**RZ58** 1.4-GB Full-Height	**TZ30** 95-MB Half-Height	**TZK10** 525-MB Half-Height	**TLZ06** 4.0-GB Half-Height	**RRD42** 600-MB Half-Height
SZ16B-XA/XB	1						
SZ16C-XA/XB		1					
SZ16C-CA/CB		2					
SZ16J-XA/XB			1				
SZ16J-JA/JB			2				
SZ16J-KA/KB			1			1	
SZ16X-HA/HB				1			
SZ16X-EA/EB					1		
SZ16X-KA/KB						1	
SZ16X-FA/FB							1

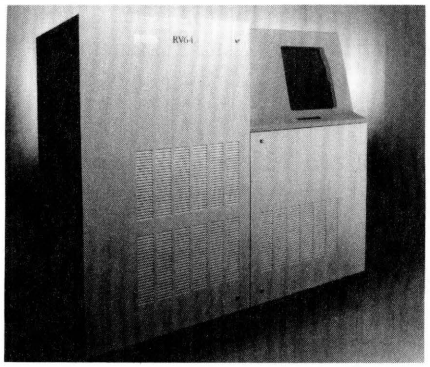
If desired storage combinations are not offered, order a single-drive SZ16 configuration plus an upgrade kit.

Upgrade Kit Configuration Rules

- A free storage cavity must be available for each additional drive.
- Upgrade Kit devices are customer installable

Order Number	Disk Drives			Tape Drives			Compact Disk Drives
	RZ56 665-MB Full-Height	**RZ57** 1.0-GB Full-Height	**RZ58** 1.4-GB Full-Height	**TZ30** 95-MB Half-Height	**TZK10** 525-MB Half-Height	**TLZ06** 4.0-GB Half-Height	**RRD42** 600-MB Half-Height
RZ56-UK	1						
RZ57-UK		1					
RZ58-UK			1				
TZ30-UK				1			
TZK10-GG					1		
TLZ06-GG						1	
RRD42-JL							1

RV64 Optical Library Jukebox System



The RV64 Optical Library Jukebox system provides up to 128 Gbytes of near online storage using high-capacity RV02 optical platters. It is an ideal tool for large applications that need to store and retrieve huge quantities of data and/or large numbers of documents or image files.

The RV64's automated cartridge handling and 64-platter capacity reduces or eliminates the operator's physical activities associated with archiving and retrieving information. The subsystem can accommodate up to four RV60 (modified RV20) drives in a variety of master/slave configurations and can handle a maximum of 64 RV02 cartridges for 128 Gbytes of storage. The RV64 attaches to VAXcluster and Ethernet networks via a VAXBI library node.

Media Management Software (MMG) V1.0 is a tool for applications developers and a utility for system managers and operators. MMG's database keeps track of the content and status of jukeboxes, drives, cartridges, and volumes, and eliminates the requirement for users and applications developers to monitor the location and status of individual drives and cartridges.

Features

- Total cycle time: 13–15 seconds (time to retrieve and insert cartridge and access beginning of file)
- Software support: Jukebox Control Software (JCS) V1.0 and MMG V1.0 (included), VMS V5.1 or later
- Drive performance: Refer to the RV20 Optical Drive section

Ordering Information

RBV64-AA/AD	Optical Library with one master drive, 60/50 Hz.
RBV60-A	Add-in master optical drive for RBV64 jukebox.
RV60-B	Add-in slave optical drive for RV64 jukebox.
RV02K-01	2-Gbyte media in cartridge.
QL-VHBA9-AA	License for Jukebox Control Software V1.0 (included with RBV64s above).
Note: Media-specific H-kit must be ordered.	
QA-VHBAA-H5/HM	Jukebox Control Software media and documentation kit (TK50/magtape).
QA-VHBAA-GZ	VAX JCS V1.0 documentation set only.
QT-VHBAx-xx	Support services for JCS—Jukebox Control Software SPD 25.D6.
QL-VZDA9-AA	License for Media Management Software V1.0 (included with RBV64s above).
QA-VZDAA-H5/HM	Media Management Software media and documentation kit (TK50/magtape).
QA-VZDAA-GZ	VAX MMG V1.0 documentation set only.
QT-VZDAx-xx	Support services for MMG—Media Management Software SPD 31.40.

Note: All RBV64 and RBV60 models include appropriate cables and KLESI interface modules. They can attach to VAXBI-based processors. One VAXBI backplane slot is required for each master drive in the configuration. The robot interface requires a DMB32/DHB32 in the host. The RV64 uses RV02K-01 media.

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @					VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V		
RBV60-A	1 VAXBI slot	7.0	0.0	0.0	0.0	0.0	1	1

Specifications

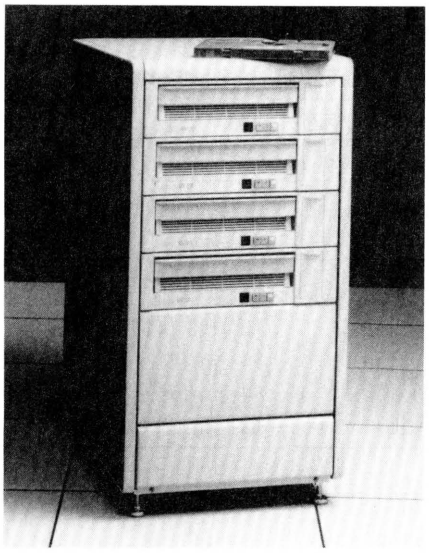
Physical Characteristics

Height	152.0 cm (60.0 in.)
Width	162.0 cm (64.0 in.)
Depth	142.0 cm (56.0 in.)
Weight	753.0 kg (1660.0 lb)

Power Requirements

Current (ac amps)	13.0/6.5
Watts	1300
NEMA receptacle type	5-20R
PCS+/PDS+ cable type	BC24N (120 V)
Number of phases	1

RV20 Write-Once Optical Drive



The RV20 laser disk drive (with its RV02 media) is based on write-once-read-many (WORM) optical technology, in which the user can record data of any type to the media and read it as many times as desired; data cannot be erased or destroyed. This technology provides a cost-effective tool for archiving huge quantities of data on compact, rugged cartridges for 30 years or more.

The RV20 subsystem comes in a 1-meter-high, 0.5-meter-wide (40-inch-high, 19-inch-wide) H9643 storage cabinet only. Each master connects to the backplane of supported VAXBI, UNIBUS, or Q-bus systems through the KLESI bus adapter (also used with TU81E). Most processors support up to four KLESIs per channel, and eight per system (in the case of multiple-channel systems, refer to relevant *Systems* chapters of this catalog). Digital's RV02 cartridges can be used on any Digital RV20 or RV64 subsystem.

As many as four RV20s, in any combination of master/slave configurations, can fit into one cabinet. Up to three slaves can be daisychained onto one master, provided that the application's performance requirements can accept the lower per-drive throughput that will result from multiplexing.

Features

- Capacity: 1 Gbyte formatted per side; two-sided media
- Transfer rate: 262 Kbytes/s (formatted, sustained); 1.33 Mbytes/s (burst rate)
- Access time: 212.5 ms
- Average seek time: 150 ms
- Latency: 62.5 ms
- Media life: 5 years prerecording; 30 years readable
- Transports per controller: 4
- Controllers per CPU: up to 4
- Maximum cable length (CPU to drive): 6.1 meters (20 feet)
- Supported by VMS V4.6 or later

Ordering Information

RBV20-PA/PD	Master drive with VAXBI KLESI, H9643-BC cabinet, cabling
RQV20-PA/PD	Master drive with MicroVAX II KLESI, H9643-BC cabinet, cabling
RSV20-PA/PD	Master drive with KLESI-Sx, H9643-BC cabinet, and cabling
RBV20-A	Add-in master drive with VAXBI KLESI and cabling
RQV20-A	Add-in master drive with MicroVAX II KLESI and cabling
RSV20-A	Add-in master drive with BA213 KLESI and cabling
RV20-B	Slave drive with cabling
RV02K-01	2-Gbyte media cartridge

Configuring Information

Option	Mounting Requirements	dc Amps Drawn @			Bus Loads Drawn	I/O Panel Units
		5 V	15 V	−15 V	dc	
RUV20-PA/PD	1 quad slot	4.0	0.0	0.0	1.0	1
RQV20-PA/PD	1 dual slot	3.0	0.0	0.0	1.0	1A
RSV20-PA/PD	1 dual slot	3.0	0.0	0.0	1.0	1A

Option	Mounting Requirements	dc Amps Drawn @					VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V		
RBV20-PA/PD	1 VAXBI slot	7.0	0.0	0.0	0.0	0.0	1	1

Specifications

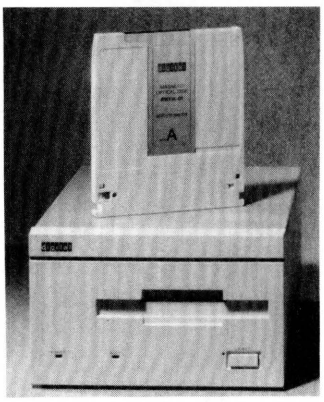
Physical Characteristics

	RV20	In Cabinet
Height	13.0 cm (5.1 in.)	106 cm (41.8 in.)
Width	48.3 cm (19.0 in.)	54 cm (21.3 in.)
Depth	65.0 cm (25.6 in.)	84 cm (33.1 in.)
Weight	25.0 kg (55 lb)	121 kg (266.2 lb)

Power Requirements

Current (ac amps)	2.5/1.25	
Watts	200	
Btu/h	683	
NEMA receptacle type		L5-30R
PCS+/PDS+ cable type		BC24S (120 V) BN29H (240 V)
Number of phases		1

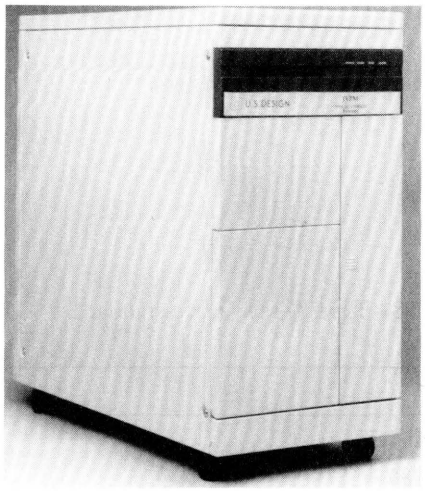
Rewritable and WORM Optical Storage Subsystems



Rewritable and WORM optical storage subsystems are based on a finite set of third-party optical hardware components (drives and jukeboxes) that are integrated into Digital's systems by third-party integration (software) kits. A total subsystem consists of the hardware component plus the integration kit (software) component.

REWRITABLE MO (Magneto Optical—the most common rewritable or erasable optical technology) optical recording is the optical technology that is functionally equivalent to magnetic disk recording in that randomly accessible sectors can be written, read, and overwritten. Erasable optical media is useful in applications where eventual media reuse is required. The shelf life of rewritable optical media is a minimum of 10 years.

Rewritable and WORM Optical Storage Subsystems *(Continued)*



WORM (Write Once Read Many) optical technology enables the user to encode any data permanently onto the surface of the WORM optical disk (media). With WORM technology, the data is safe from being overwritten. WORM data can be written only once, overwrites of the data are not possible. Additional data writes are automatically encoded onto the remaining space on the disk. WORM optical subsystems are of particular interest in security, legal, financial and medical applications where the integrity of the data important. The shelf life of WORM optical disks is a minimum of 25 years.

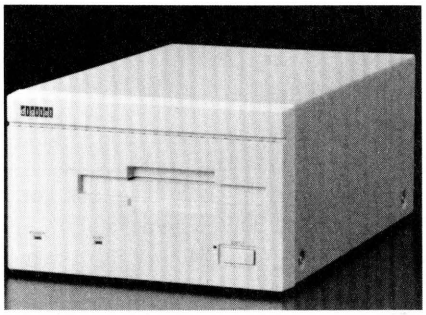
The REWRITABLE offerings are available in 5.25-inch form factor and the WORM offerings are available in both 5.25-inch and 12-inch form factors. REWRITABLE storage capacity ranging from 594 Mbytes (desktop) to 33.2 Gbytes (5.25-inch jukebox), and WORM storage capacity ranging from 654 Mbytes (desktop) to 328 Gbytes (12-inch jukebox)

Features

- Near-line data access
- Total storage solution
- End-user integration
- Data security
- Cost effective data storage
- VMS and RISC/ULTRIX integration
- High capacity data storage
- Removability

Note: For more information on Rewritable and WORM optical storage subsystems, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

RWZ01 Optical Disk Drive



The RWZ01 is a 5.25-inch, rewritable, tabletop, magneto optical disk drive. On a compact, double-sided 5.25-inch diameter disk, the RWZ01 disk drive contains up to 594 Mbytes (297 Mbytes per side) of formatted data. The disk must be manually turned over to access the second side.

Optical disk technology provides a means by which large amounts of data can be stored at a comparatively low cost. In optical storage, a very tightly focused laser beam is used to read and write to the surface of the platter, eliminating disk wear. The RWZ01 emulates a magnetic disk drive, providing random access to data.

The RWZ01 contains modified firmware which enables it to connect directly to SCSI ports on Digital workstations, DECstations, and DECsystems. For connection to Q-bus MicroVAX systems, KZQSA adapter is required. It is operated by disk driver software which is embedded in VMS and ULTRIX operating systems, allowing operators to use standard operating system commands.

The disk comes in a protective cartridge to safeguard against scratches, fingerprints, and dust. The cartridge can be removed from the drive and filed compactly in archives or transported easily from one system to another for effective data sharing.

RWZ01 Optical Disk Drive *(Continued)*

Features

- Removable 5.25-inch diameter media
- Tabletop enclosure
- Customer-installable
- Capacity per disk: 594 Mbytes
- Raw data transfer rate: 620 Kbytes/second
- Read transfer speed: 166 Kbytes/second
- Write transfer speed: 91–93 Kbytes/second
- Average access time: 95 ms
- Media shelf/archival life: More than 15 years
- Conforms to all requirements of the ISO 10089 Type A rewritable standard
- Auto-ranging power supply

Prerequisites

Hardware

- KZQSA adapter for Q-bus MicroVAX systems
- SCSI interconnect cable must be ordered separately
- Disk cartridge media

Software

VMS Version 5.4-1 or later
ULTRIX Version 4.0 or later

Ordering Information

RWZ01-AA	5.25-inch rewritable tabletop optical disk drive with universal power supply. SCSI cables and disk cartridge media must be ordered separately. Includes 120-V power cord; 240-V power cord must be ordered separately.

Power Cords

BN19A-2E	U.K./Ireland
BN19D-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19N-2E	Italy
BN19U-2E	Israel

SCSI Cables

BC06P-xx	50-pin right-angle bale lock to 50-pin right-angle bale lock connector for MicroVAX, DECsystem 5100, DECsystem 5500*, VAXstation 4000, InfoServer 150 and Q-bus MicroVAX systems (via KZQSA)
BC56H-xx	68-pin straight microconnector to 50-pin straight bale lock connector for VAXstation 3100, DECstation 2100, DECstation 3100
BC09D-xx	50-pin straight bale lock to 50-pin straight microconnector for DECstation 5000 Models 200/240

* Via SCSI port only

Supplies

RWX1K-01	Optical disk cartridge media
RWX1H-AA	Lens cleaning cartridge

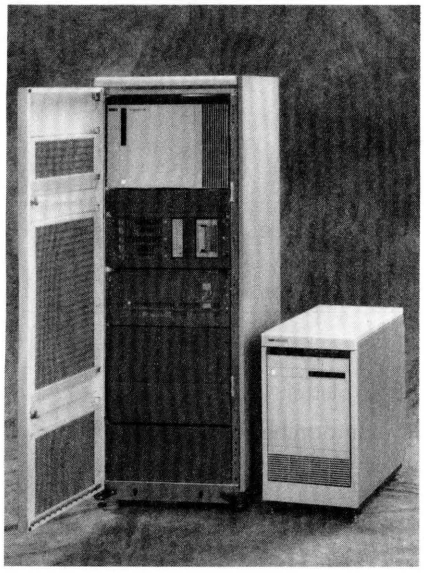
Specifications

Physical Characteristics

Height	12.7 cm (5.0 in.)
Width	21.3 cm (8.4 in.)
Depth	31.1 cm (12.25 in.)
Weight	6.8 kg (15.0 lb)

Note: For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

StorageServer 100 Optical Storage System



The StorageServer 100 product is an ULTRIX-based hierarchical storage system which directly manages 19 to 114 Gbytes of compact, rewritable optical storage at costs more typical of off-line media.

Network file servers can satisfy the needs of storage-intensive applications such as imaging, multimedia, automated libraries of engineering diagrams and documents, and extended databases. Clients may include UNIX systems, IBM PCs and compatibles, Macintosh and VMS systems using popular communications protocols including TCP/IP, NFS, DECnet/OSI, and PATHWORKS.

The StorageServer 100 product utilizes both rewritable optical and magnetic disk technologies. StorageServer software automatically migrates files between magnetic disk and optical platters based on usage patterns in an application-transparent manner. Magnetic storage is dynamically allocated to active files, whereas inactive files reside on optical platters. Consequently, file system responsiveness remains extremely high. The number of system bus connections is greatly reduced while the amount of on-line storage is dramatically increased.

Features

- 19 to 114 Gbytes of high capacity, compact storage
- Incremental expansion in units of 19 Gbytes with 32 optical platters
- Uses industry-standard 5.25-inch rewritable optical platters with 595-Mbyte capacity (formatted) per platter
- File access transparent to users and applications
- Individual files may be up 2 Gbytes in size, independent of capacity of media
- Significantly lower maintenance costs than magnetic storage

Prerequisite Hardware

DECsystem 5000 Model 240 or DECsystem 5900

Each 19-Gbyte deskside or rackmount optical library requires three available SCSI bus connections, one for each of the two optical drives and one for the mechanical selector.

Sufficient "front-end" magnetic storage as noted under "Configuration Notes" below.

Prerequisite Software

ULTRIX 4.2C or later

Configuration Notes

Optimal performance assumes the proper ratio of magnetic storage to the total storage according to the percentage of active files, the size of those files, and the read/write ratio. Variations are to be expected according to the workloads.

The percentage of the total storage that should be magnetic will typically be between 5% to 20%.

Ordering Information

RW100-AA	Deskside base option, TK50 media
RW100-BA	Deskside base option, CD-ROM media
RW100-DA/DB	For DECsystem 5900; factory/field installed in system cabinet
RW100-CA	Deskside add-on option

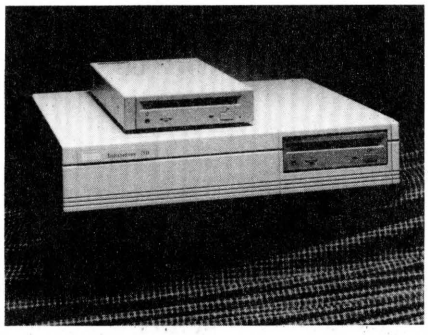
Specifications

Physical Characteristics	
Deskside cabinet	
Dimensions	720 × 375 × 800 mm (28.3 × 14.8 × 31.5 in.)
Weight	79 kg (174 lb)
Rackmount	
Dimensions	400 × 483 × 759 mm (15.7 × 19.0 × 30.0 in.)
Weight	58 kg (127 lb)

Power Requirements (Deskside or Rackmount)	
Line Voltage	100–127 Vac, 200–240 Vac, 50–60 Hz
Power Consumption	250 W maximum, 110 W typical

- Deskside or rackmount unit
- 19 Gbytes maximum with full complement of 32 platters
- 595 Mbytes per platter, with 512 bytes/sector, conforming to ISO/IEC 10089A and ANSI X3B11 standards
- Multifunction optical drives
- Two drives per deskside or rackmount unit
- Maximum transfer rates: 680 Kbytes/s read, 340 Kbytes/s write

InfoServer 150/InfoServer 150 VXT Network Storage Servers



The InfoServer 150 is a dedicated network storage server that delivers information across multiple operating platforms. It provides SCSI storage access to a variety of clients in an 802.3/Ethernet LAN. A caching scheme, sophisticated software, and 60-ns CPU chip allow the InfoServer 150 to deliver information to up to 100 clients at a performance rate equal to that of a locally attached device. It supports 14 SCSI devices*, including CD-ROM, hard disk, tape, and magneto-optical drives.

In addition, InfoServer V2.1 software provides VMS backup support. This means that VAX systems can be backed up to one centralized management point, the same point through which software is distributed.

InfoServer 150 client software is available for VMS, ULTRIX, generic DOS, PATHWORKS for DOS, Macintosh, and Novell NetWare environments, as well as for the VXT 2000. The InfoServer 150 system's ability to serve multiple clients simultaneously, regardless of format, is achieved using LASTport/Disk. This sophisticated protocol allows the InfoServer 150 to transfer information at the block level, regardless of the file format being served. DOS clients can read ISO 9660 and High Sierra formats while VMS users read ODS-2 formats, and ULTRIX clients read ISO 9660, ULTRIX File System (UFS), and Berkeley Software Distribution file formats.

Features

- Allows users of DOS PCs, RISC workstations, VAX, and Macintosh systems to access information stored in multiple formats simultaneously
- Easy to install and use—features preconfigured hardware and factory-loaded software
- Cost-effective—serves as a shared LAN peripheral for up to 100 clients
- Rights to use all Digital-developed InfoServer 150 clients are included with the server license
- Supports up to 14 locally-attached SCSI devices including CD-ROM, tape, hard disk, and magneto-optical drives

InfoServer 150 VXT

Specifically designed for use with the VXT 2000 X Window terminal, the InfoServer 150 VXT extends physical memory by creating a virtual memory environment for each VXT 2000. This system is preconfigured with InfoServer software V2.1 and VXT software. System managers can use the VXT software to manage VXT 2000 terminal work groups across the network. The InfoServer 150 VXT acts as a load device for VTX 2000 software and also serves as a network storage device for high-speed font access. It can be upgraded to include disk and/or tape access.

* The InfoServer 150 supports up to 14 SCSI devices when ANSI bus length requirements are observed.

Prerequisite Hardware

Ethernet drop; both ThinWire or thick wire connections are supported.

Ordering Information

Each of the base package configurations allows users to access CD-ROMs and hard disks. The ability to serve tapes to VMS clients (tape function access) is included with the SEACT and SEACU systems. InfoServer 150 SEACD and SEACE systems can be upgraded to include tape functionality by ordering the appropriate media and license. InfoServer 150 VXT systems can be upgraded for disk and tape access by ordering the appropriate media kits and licenses. It is also possible to order the InfoServer Client for VXT media kit, which allows the InfoServer to support up to eight VXT 2000 terminals. See Chapter 8, *Terminals and Printers,* for ordering details.

Ordering Information
(Continued)

Note: All configurations include the following: factory-installed InfoServer V2.1 software, hardware and software documentation, SCSI disk drive, and an internal RRD42 CD-ROM drive.

SEACD-AA/A9	InfoServer 150 disk server with RZ23L 121-Mbyte disk drive and one internal CD-ROM drive; can be upgraded to include tape function access. See Software Options.
SEACE-AA/A9	Same as above except includes two CD-ROM drives
SEACT-AA/A9	InfoServer 150 disk and tape server with RZ23L 121-Mbyte disk drive and one RRD42 CD-ROM drive; includes media and licenses for disk and tape function access
SEACU-AA/A9	Same as above except includes two CD-ROM drives
SEACV-AA/A9	InfoServer 150 VXT with RZ24 209-Mbyte disk drive and RRD42 CD-ROM drive; preconfigured with VXT 2000 software. Can be upgraded to disk and tape function access. See Software Options.
SEACW-AA/A9	Same as above except includes two CD-ROM drives.

Hardware Options

Each InfoServer 150 supports up to 14 SCSI devices (including the integral RZ23L and RRD42 CD-ROM drives).

RRD42-FA	Tabletop external 600-Mbyte CD-ROM drive
TK50Z-GA/G3	SCSI subsystem, TK50 controller expander box (maximum two; each must be placed at end of SCSI bus.)
TLZ04-MA	Tabletop external 1.2-Gbyte digital audiotape (DAT); includes BC56H-03 SCSI cable
TLZ04-FA	Tabletop external 1.2-Gbyte digital audiotape (DAT)
TZ85-TA	2.6-Gbyte tabletop tape subsystem with data cartridge, cleaning kit, and 120-V power cord.
TSZ07-AA	1600/6250-bit/inch SCSI rackmountable 9-track magtape*
TSZ07-BA	1600/6250-bit/inch SCSI 9-track magtape mounted in H9642 cabinet, 120 V; power cord included
TSZ07-CA	1600/6250-bit/inch SCSI tabletop 9-track magtape*
RWZ01-AA	Magneto-optical drive

* Requires country kit—see TSZ07 description in this chapter.

SZ12 Expansion Box

See SZ12 description in this chapter for additional external RZ, tape, and CD-ROM ordering information. Note that RZ series drives are not supported on the InfoServer 150 or InfoServer 150 VXT systems.

Note: Most external devices include both BC56H-03 and BC19J-1E cables. For those devices that do not include the connected cables, e.g., RWZ01-AA, order BC56H-03 if the device is the first on the external bus, or BC19J-1E if the device is in any other position on the bus.

Clients

Clients are defined as those systems that use the InfoServer as a logically mounted drive. These clients can be individual Ethernet PCs, workstations, or host systems serving any number of terminals and workstations.

Media and documentation only. The right to use up to 100 clients is included with the InfoServer server license in the base packaged systems.

QA-YSHAB-Hx	InfoServer Client for ULTRIX/RISC media and documentation kit
QA-YSHAC-Hx	InfoServer Client for ULTRIX/VAX media and documentation kit
QA-YSHAD-HW	InfoServer Client for DOS media and documentation kit
QA-YSHAE-HC	InfoServer Client for Macintosh media and documentation kit

* x denotes media type, 5 = TK50, M = magtape, 8 = CD-ROM

Software Options

QA-YSHAA-H8	InfoServer V2.1 media and documentation kit
QL-YSH99-RA	InfoServer software kernel update license
QL-XZYA9-AA	InfoServer disk function access license
QL-XZYAA-H8	InfoServer disk function access media kit
QL-XZZA9-AA	InfoServer tape function access license
QA-XZZAA-H8	InfoServer tape function access media and documentation kit, InfoServer V.20 software or higher is required for tape functionality

Country Kits

SEAKC-AA	U.S.
SEAKC-AC	Canada
SEAKC-AD	Denmark
SEAKC-AE	U.K./Ireland
SEAKC-AP	France
SEAKC-AG	Germany/Austria
SEAKC-AI	Italy
SEAKC-AJ	Japan
SEAKC-AK	Switzerland
SEAKC-AT	Israel
SEAKC-AZ	Australia
SEAKC-BJ	India

Specifications*

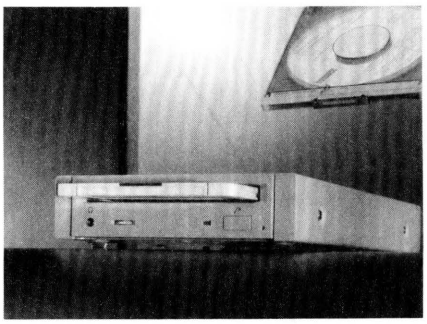
System enclosure	Tabletop
Maximum total drives	14 (Including integral hard disk and CD-ROM drive)
Ethernet communications	One AUI (thick wire)/ThinWire port One console port
Physical Characteristics	
Height	10.33 cm (4.07 in.)
Width	46.38 cm (18.26 in.)
Depth	39.42 cm (15.52 in.)
Weight	11.4 kg (25 lb)
Power Requirements	
Nominal voltage	110/240 V
Power source phasing	Single
Nominal frequency	50 Hz–60 Hz
Voltage range	88 V–132 V; 176 V–264 V
Line frequency tolerance	47 Hz–63 Hz
Maximum running current	2.8 A/1.5 A
Maximum power consumption	190 W
Operating Environment	
Temperature (sea level)	10° to 32° C (50° to 90° F)
Relative humidity	10% to 80%
Non-condensing maximum operating altitude	2.4 km (8,000 ft)

For additional ordering information on the InfoServer 150 VXT and the VXT 2000, in Chapter 8, *Terminals and Printers.*

* Tape function access is not available to ULTRIX clients at this time. In addition, ISL for ULTRIX systems is not supported at this time.

Client notes: InfoServer client code is included in VMS V5.4 and V5.5 and PATHWORKS for DOS V4.1. For DOS and Novell NetWare environments, order the InfoServer Client for DOS media kit. The InfoServer Client for VTX media kit can be used with InfoServer 150 systems.

RRD42 Compact Disc Drive



The RRD42 CD-ROM subsystem is an industry-standard, 5.25-inch half-height device that fits conveniently into a system cabinet or in a desktop enclosure. The media is a removable 4.7-inch compact disc enclosed in a protective cartridge carrier which is loaded at the front of the drive. The subsystem offers an excellent vehicle for distributing software, layered applications, and upgrades to desktop worksystems and networked systems. It is also available as a complete solutions packaged called DECdisc. DECdisc is a solutions package containing software applications, documentation, service information, and the low-cost tabletop RRD42 compact disc drive. Different versions are available for VMS V5.4-2 and RISC ULTRIX V4.2.

Available for Small Computer Systems Interface (SCSI) based systems, the RRD42 device appears to the system as a high-capacity write-protected Winchester disk drive. The RRD42 subsystem can be configured in an Ethernet Local Area Network via the InfoServer 150, allowing system managers to download software and documentation to non-SCSI-based systems. The RRD42 subsystem can also connect to Q-bus systems through the KZQSA adapter.

Powerful error correction features in both the drive and the controller ensure high data integrity.

Features

- Configuration options: tabletop or embedded (SCSI format)
- Formatted capacity: 600-Mbyte disc
- Average access time: 0.45 second
- Average transfer rate: 150 Kbytes/second
- Average seek time: less than 500 ms
- Form factor: 5.25 inches, half-height
- Data format: Philips/Sony CD-ROM standard
- Medium: replicated optical disk, 120-mm (4.7-in.) diameter
- Corrected bit error rate: not greater than 1 in 10^{13}

Ordering Information

Note: RRD42s are 600-Mbyte SCSI CD-ROM drives.

RRD42-EM/EL	RRD42 for DECsystem 5100, factory/field installed.
RRD42-FM/FL	RRD42 for DECsystem 5000 Models 125/133; factory/field installed.
RRD42-JM/JL	RRD42 for VAXstation 4000 Models 60/90; factory/field installed.
RRD42-GM	RRD42 for MicroVAX 3100, Model 10e/20e; factory installed.
RRD42-FA	RRD42 tabletop for InfoServer 150; VAXstation 3100, 4000; DECstation 2100, 3100, 5000; DECsystem 5000, 5100; VAX 4000 Model 100; and MicroVAX 3100; includes connecting cables and 120-V power cord.
RRD42-FB	RRD42 tabletop for MicroVAX 3300, 3400, 3800, 3900; MicroVAX II; BA2x- and BA4xx-based VAX 4000s; and DECsystem 5500. Includes connecting cables and power cord.
RRD42-DG	RRD42 tabletop for InfoServer 150; VAXstation 3100, 4000; MicroVAX 3100; DECstation 2100, 3100, 5000; VAX 4000 Model 100; DECsystem 5000 and 5100. Includes connecting cables. Requires country-specific power cord.
RRD42-DH	RRD42 tabletop for MicroVAX 3300, 3400, 3800, 3900; BA2x- and BA4xx-based VAX 4000s; and MicroVAX II. Includes connecting cables. Requires country-specific power cord.
RRD42-UK	RRD42 upgrade to SZ12 and RZ5x dual-drive expansion boxes; customer installed.

Ordering Information
(Continued)

RRD4X-CA	Five protective plastic caddies for RRD42.
RRD42-GA	RRD42 tabletop drive for PC/AT compatible computers. Includes host bus adapter, interface cable, SCSI bus terminator, Adaptec software drivers with MS-DOS CD-ROM extensions, installation manual, power cord, and two caddies.

Note: See SZ12 description in this chapter for RRD42 included in SZ12 dual-drive expansion box.

Power Cords

For 240-V options select appropriate power cord.

BN19A-2E	U.K./Ireland
BN19W-2E	Germany, Austria, Belgium, Finland, France, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN19Z-2E	Italy
BN19S-2E	India
BN18L-2E	Israel

Note: Order the 120-V RRD42 for Japan, Mexico, and Canada.

DECdisc—CD-ROM Solution Package

The DECdisc package offers the opportunity to try software applications before purchasing them. For VMS systems, a customer can try four of 24 selected applications from the VMS Consolidated Software Distribution offering. Customers can install and use applications, tools, and layered products for 90 days. For RISC ULTRIX systems, a customer has access to the Software Store for ULTRIX, consisting of demonstrations of 25 third-party applications. Digital software can be purchased from *DECdirect* catalog and third-party software can be ordered directly from Digital's third-party partners.

RISC ULTRIX Version

- Tabletop model of RRD42 CD-ROM
- ULTRIX V4.2 binaries (one disk)
- Online documentation library
- Software Store for ULTRIX
- Informational fliers: *Software Update Services* and *Media Replication and Distribution Services*

VMS Version

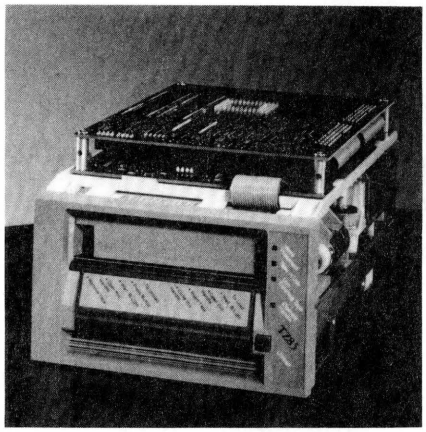
- Tabletop model of RRD42 CD-ROM
- VMS Consolidated Software Distribution (four disks)
- Online documentation library (one disk)
- Trial Software PAKS (four)
- Informational fliers: *Software Update Services*, *Media Replication and Distribution Services*, and *DEClearn*

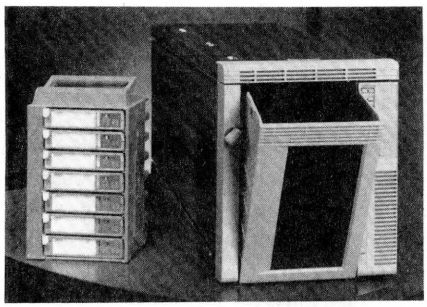
Ordering Information

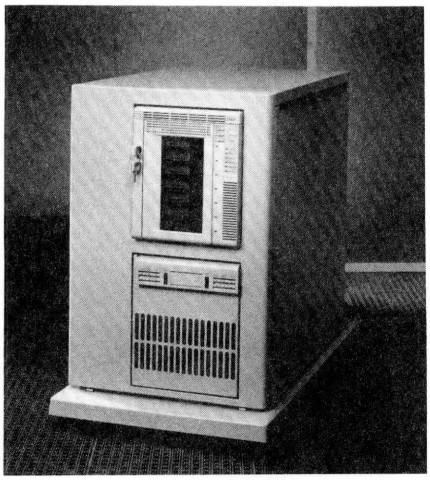
Note: All RRD42s are 600-Mbyte SCSI CD-ROM tabletop models; include connecting cables, documentation, and power cords.

RRD42-FC	RRD42 for VAXstation 3100, InfoServer 150, and MicroVAX 3100. Includes VMS DISC package.
RRD42-FD	RRD42 for DECstation 2100, 3100, 5000; DECsystem 5000, 5100, 5500. Includes ULTRIX DISC package.
RRD42-FE	RRD42 for MicroVAX 3300, 3400, 3800, 3900; MicroVAX II, and VAX 4000. Includes VMS DISC package.

Tx800 Family of Cartridge Tape Drives







The Tx800 cartridge tape drives are industry-leading 5.25-inch streaming linear recording tape devices, designed for systems requiring high performance, high data integrity, and unattended backup. The performance and capacity of the Tx800 cartridge tape drive subsystem is unrivaled. With a sustained transfer rate of up to 800 Kbytes per second and up to 2.6 Gbytes of formatted capacity, the Tx85 tape drives can complete full backups in under an hour. With the same transfer rate, the Tx86 tape drive systems support up to 6 Gbytes of formatted capacity.

A 512-Kbyte adaptive cache matches the speed of the tape subsystem to system performance, minimizing repositioning delays, and a dual-channel read/write head design provides a high data transfer rate.

Extensive error detection and correction make the data integrity of the Tx800 cartridge tape subsystem comparable to that of magnetic disks. Other advanced data integrity features include a custom 64-bit CRC on each 2 Kbytes of data on media; a powerful custom Reed Solomon ECC, end-to-end EDC on data (onto media and back) overlapped with parity from the DSSI bus, as well as parity checking on data cache memory. These features combine to produce undetected errors of less than 1 in 10^{27} bits and unrecovered read errors of less than 1 in 10^{17} bits.

Extensive diagnostic and troubleshooting features include serial EIA-422 ports on the subsystem and controllers for offline troubleshooting and POST (power on self-test) error reporting, embedded diagnostic and self-test software, and LEDs for indication of operating and fault information.

Tape composition, rugged cartridge design, and gentle tape handling of the Tx800 cartridge tape subsystems result in a durable medium that can be used for over 20,000 tape-head passes.

The Tx800 cartridge tape drive subsystems use the CompacTape III cartridge, which contains 335 meters (1100 feet) of half-inch-wide metal powder (MP) tape. MP tape is a durable medium, thus providing longer media life than many other tapes. While the CompacTape III cartridge resembles earlier cartridges, it is not interchangeable in earlier tape drives. However, the Tx85 tape drive subsystem accepts and reads cartridges from TZ30, TK50, TK70, and TF70 tape drives. Users currently employing these tape subsystems for backups, archiving, and software interchange can thus protect their earlier investment. The Tx86 drives, on the other hand, offer Tx85 read and write compatibility, but no TZ30/TK50/TK70 read compatibility.

Features

- DSSI interface (TF devices)
- SCSI interface (TZ devices)
- Extensive embedded diagnostic/self-test software
- Four LEDs and audio indicators of subsystem status on front panel

Tx85 Features

- Up to 2.6-Gbyte formatted capacity per cartridge
- TZ30/TK50/TK70 read compatibility
- Available as system embedded and in an attractive tabletop enclosure

Tx86 Features

- Up to 6-Gbyte capacity per cartridge
- Available in tabletop enclosure only
- Read/write compatibility with Tx85 drives
- Tx86 drives are NOT read compatible with TZ30/TK50/TK70 drives.

Software Support

Most common tape functionality, such as COPY, MOUNT, INIT, BACKUP, TAR, and DUMP will function normally on VMS V5.3 or later or ULTRIX V4.2 or later for SCSI support. DSSI is supported by VMS V5.4-2 and not on ULTRIX. For some of these earlier versions of the operating systems, there are some operational limitations in such areas as device name recognition, error reporting facility, and standalone backup. These restrictions depend on the type of drive, system, and version of operating system used. Contact a Digital Sales Office for a list of support limitations.

TF85/TZ85 Ordering Information

Note: Tx85s are 2.6-Gbyte (formatted) extended 5.25-inch, 800-Kbyte/s cartridge tape subsystems; each incudes tape cartridge, head cleaning cartridge, mounting chassis, cables, and documentation.

TF85B-AA	TF85 factory-installed-only version for VAX 6000 systems
TF85C-AA	TF85 for VAXft 610/612 systems
TF85E-JA/JF	TF85 for BA4xx enclosure and R400X/B400X expansion pedestals; factory/field installed.
TF85E-27	Same as TF85E-JF—quantity 27 (full palette)
TF85-TA	TF85 in tabletop enclosure for DSSI-based systems, includes U.S. power cord
TF85T-18	Same as above—quantity 18 (full palette)
TF85D-AA	TF85 cartridge tape subsystem for VAXft Model 610/612 systems, includes mounting chassis and cables
TZ85E-MX	TX85 cartridge tape subsystem, field installable for VAX 4000 systems, includes mounting hardware
TZ85-TA	TX85 cartridge tape subsystem in tabletop enclosure for SCSI-based systems
TZ85-RA	Includes one TZ85-TA, VAXBI adapter, internal cable with I/O bulk head connector; order external SCSI cable (BC19J-xx) separately
TFM85-AA	TF85 tape drive for DSSI-based systems, includes KFMSA-BA XMI-DSSI controller and CK-KFMSA-LJ cable kit
TFM85-DA	Same as TFM85-AA except for VAX 7000 systems
TFM85-TA	Same as TFM85-AA except in tabletop enclosure

Configuration Notes

1. When connected to a KFQSA installed in a MicroVAX II or MicroVAX 3xxx (except MicroVAX 3100) system, the TF85 and TF857 tape subsystems do not support booting of MicroVAX Diagnostics Monitor (MDM) or VMS.
2. VMS V5.4-2 is required for boot support on VAX 4000 series systems and MicroVAX 33/34xx series systems (only bootable on embedded DSSI adapter), although a TZ85 can be booted on a MicroVAX 3100. VMS V5.4-3 is required for VAX 6000 and VAX 9000 series systems.
3. For optimum TF85/TF857 backup performance, Digital recommends the TF85/TF857 be connected to a high-performance adapter such as the KFMSA adapter module on the VAX 6000 and VAX 9000 or the embedded DSSI adapter such as those found on VAX 4000 systems.
4. For VAX 4000 systems, the DSSI controller module is physically attached to the tape drive, and therefore the subsystem can only be mounted in the removable-media slot in BA430 and BA440 pedestal enclosures, which were designed to house this tape drive/controller combination.

TF86/TZ86 Ordering Information

Note: Tx86s are 6-Gbyte (formatted) SCSI-2 cartridge tape drive subsystems with 800-Kbyte/second transfer rate. Each includes a tape cartridge, U.S. power cord, and documentation.

TF86-TA/TB	Tabletop version, 110 V/120 V
TFM86-TA/TB	TF86-TA with KFMSA-BA DSSI controller and CK-KFMSA-LN, 110 V/120 V
TZ86-TA/TB	Tabletop version, 110 V/120 V
TZ86-RA	Same as above with VAXBI controller

Cables, media, and power cords for the Tx800 family are described on page 7.84.

Tx800 Family of Magazine Tape Subsystems

The two Tx800 magazine tape subsystems—Tx85 and Tx867—combine the cartridge drive and an automatic cartridge loader to provide highly reliable unattended backup for SCSI, DSSI, and CI systems. Up to seven cartridges are inserted into the magazine, a removable storage rack. An internal, elevator-like mechanism moves to each of the storage slots to load and unload cartridges. When fully loaded, the Tx857 subsystems can back up as much as 18 Gbytes in a single shift (8 hours) without operator intervention. The Tx867 subsystems can back up as much as 42 Gbytes in two shifts (16 hours) without operator intervention.

The Tx800 magazine tape subsystems are offered in half-rack enclosure for inclusion in the BA100 storage array pedestals or the integrated storage array system.

Tx857/Tx867 Features

- Incorporates the 2.6-Gbyte Tx85/6-Gbyte Tx86 cartridge tape drive
- Maximum capacity: up to seven cartridges for up to 18.2-Gbyte unattended backup
- TZ30/TK50/TK70 read compatibility (Tx85 only)
- Available in pedestal enclosure (SZ100/106, SA100/106)
- Available for inclusion in storage arrays (TF857, TA857)

Software Support

VMS V5.4 or higher is required for the HSC-based TA8x7/SA10x. Same limitiation as described for the Tx85/Tx86 devices.

Tx857 Ordering Information

TF857-AA/AB	18.2-Gbyte (formatted) half-rack magazine tape subsystem for VAX 6000, BA2xx- and BA4xx-based VAX 4000s, Q-bus MicroVAX 3xxx, MicroVAX II systems; includes tape subsystem, seven tape cartridges, head cleaning cartridge, tape magazine, and documentation; 120 V/240 V.
TF857-CA/CB	Same as above except for VAXft Model 610/612 systems.
SF100-PA/PB	18.2-Gbyte (formatted) magazine tape subsystem for DSSI-based systems in pedestal enclosure; includes tape subsystem, seven tape magazines, head cleaning magazine, tape magazine, pedestal enclosure, documentation; 120 V/240 V.
SF101-AA/AB	Same as above except includes KFMSA-BA DSSI controller and CK-KFMSA-LJ cable kit.
SF200-TE/TF	Half-rack magazine tape subsystem for DSSI-based systems, 18.2-Gbyte (formatted), includes DSSI storage cabinet, tape subsystem, seven tape cartridges, head cleaning cartridge, tape magazine, and documentation; 120 V/240 V.

Tx857 Ordering Information
(Continued)

TA857-AA/AB	Full-rack magazine tape subsystem for SA300 or SA400 storage arrays. 18.2-Gbyte (formatted), includes DSSI storage cabinet, tape subsystem, seven tape cartridges, head cleaning cartridge, tape magazine, and documentation; 120 V/240 V.
SZ100-AA/AB	18-Gbyte cartridge loader tape subsystem in pedestal enclosure, includes seven TK85K data cartridges, cleaning kit, tape magazine, documentation. 120-V/240-V power cord.
SZ100-RA/RB	Includes an SZ100 magazine tape subsystem and a KZBSA-CA BI-SCSI controller.
SA100-AA/AB	Half-rack magazine tape subsystem for HSC-based systems, 18.2 Gbytes (formatted) in a pedestal cabinet enclosure. Includes seven TK85K media cartridges, one TK85-M tape cartridge magazine, one TK85-HC head cleaning cartridge, HSC interface, cabinet, BC26V-25 cables, and documentation; 120 V/240 V.

Cables, media, and accessories are described on page 7.84.

Upgrades

An upgrade package is available for customers who have a Tx857 variant and want to take advantage of the Tx867's higher capacity but don't need the Tx857's software distribution compatibility. The Tx867-UG package includes the appropriate variant of the Tx86 drive, which will be exchanged in the field for the Tx85 drive that is contained in an existing Tx857 tape subsystem. Return of the existing Tx80 cartridge is mandatory.

Tx867 Ordering Information

TZ867-UG	TZ857-to-TZ867 upgrade, mandatory return of TZ85 drive
TF867-AA/AB	DSSI 42-Gbyte (formatted) cartridge loader tape subsystem for SF2xx, 120 V/240 V
TF867-UG	TF857-to-TF867 upgrade, mandatory return of TF85 drive
TA867-AA/AB	CI 42-Gbyte (formatted) cartridge loader tape subsystem, full rack, for SA300/SA900, 120 V/240 V
TA867-UG	TA857-to-TA867 upgrade, mandatory return of TZ85 drive
SZ106-AA/AB	SCSI 42-Gbyte (formatted) cartridge loader tape subsystem in pedestal, 120 V/240 V
SZ106-RA/RB	SCSI 42-Gbyte (formatted) VAXBI tape subsystem in pedestal with CI controller, 120 V/240 V
SF106-AA/AB	DSSI 42-Gbyte (formatted) cartridge loader tape subsystem with pedestal, 120 V/240 V
SF106-AC/AD	SF106-AA with KFMSA-BA DSSI controller and CK-KFMSA-LJ, 120 V/240 V
SA106-AA/AB	TA867-AA with pedestal, 120 V/240 V

Note: All TA867 or SA106 CI tape options include a BC27V-25 7.6-m (25-ft) STI cable.

Notes:
1. Tape option includes KFMSA-BA XMI-DSSI controller.
2. Factory installed only, replaces TBK70-CA on VAX 6000
3. Field installed only.
4. Quantity discounted prices for distributor channel.
5. Tape option that includes KZBSA-CA BI-SCSI controller
6. All TA8x7 or SA10x CI tape options include a BC27V-25 7.6-m (25-ft) cable.

Cables

DSSI Cables

CK-SF200-LM	2.7-m (9-ft) for VAX 6000/7000/9000/10000
CK-SF200-LP	2.7-m (9-ft) for MicroVAX 3xxx/BA2xx- and BA4xx-based VAX 4000
CK-SF100-LM	2.7-m (9-ft) for VAX 6000/7000/9000/10000
CK-SF100-LP	2.7-m (9-ft) for MicroVAX 3xxx/BA2xx- and BA4xx-based VAX 4000
CK-SF100-L3	7.6-m (25-ft) for VAX 6000/7000/9000/10000
CK-SF100-L4	2.7-m (9-ft) for MicroVAX 3xxx/BA2xx- and BA4xx-based VAX 4000
CK-SF100-L5	4.8-m (6-ft) for VAX 6000/7000/9000/10000
CK-SF100-L6	4.8-m (16-ft) for MicroVAX 3xxx/BA2xx- and BA4xx-based VAX 4000
BC21Q-3F	1.06-m (3.5-ft) daisychain cable
BC21Q-50	15.2-m (50-ft) for VAX 6000/7000/9000/10000
BC22Q-50	15.2-m (50-ft) for MicroVAX 3xxx/BA2xx- and BA4xx-based VAX 4000

SCSI Cables

Select one of the following SCSI cables for:

BC56H-03	0.9-m (3-ft) 68-pin to 50-pin pos SCSI adapter cable assembly
BC56H-06	1.8-m (6-ft) 68-pin to 50-pin pos SCSI adapter cable assembly
BC56H-03	3.6-m (12-ft) 68-pin to 50-pin pos SCSI adapter cable assembly

DECsystem 5900/DECsystem 5000 Cables

BC09D-12	3.6-m (12-ft) SCSI cable, Champ/SCSI-2

MicroVAX 3100 Models 10e, 20e, 30, 40, and 80 Cables

BC06P-2F	76.2-cm (2.5-ft) SCSI cable, TLZ04/RRD40/TZ85
BC06P-06	1.8-m (6-ft) SCSI cable, TLZ04/RRD40/TZ85
BC06P-09	2.7-m (9-ft) SCSI cable, TLZ04/RRD40/TZ85

Media

TK85K-01	Single tape cartridge for Tx800 cartridge tape subsystems
TK85K-07	Seven tape cartridges for Tx800 cartridge tape subsystems
TK85K-A0	1008 tape cartridges for Tx800 cartridge tape subsystems
TK85-HC	Head cleaning cartridge for Tx800 cartridge tape subsystems

Power Cords

The following power cords are required for supporting the Tx800 tabletop option. Choose one for each 220/240-V option ordered. The 120-V power cord is included with the Tx800 tabletop option unless another power cord is specified on the order.

BN19H-2E	Australia/New Zealand
BN19D-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN19A-2E	U.K./Ireland
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19N-2E	Italy
BN19S-2E	India
BN18L-2E	Israel

Configuration Notes

The tabletop TF86 and TF867 are supported with restrictions on any system configuration that supports the TF85 and TF857. VMS V5.4-2 is the earliest version that provides full support for the TF85. The TF86/TF867 are supported with restrictions in VMS V5.3 and higher.

DSSI Configurations

The TF85/TF86 and TF867/TF857 can be configured:

- As a field add-on in a tabletop box or storage array pedestal on VAXft 3000, MicroVAX II, MicroVAX 3xxx, VAX 4000/6000/7000/9000/10000 systems.
- Together with the KFMSA-BA XMI-to-DSSI controller for VAX 6000/7000/9000/10000 systems using the tape value packages.
- As TF867/TF857 magazine subsystems added to new or existing SF200/SF210 storage arrays and to Sx300/Sx400 DECarray cabinets.
- Share the TF86/TF867 investment across multiple hosts by implementing multi-host DSSI VAXclusters.
- As daisychained storage devices with up to two tape drives able to be shared on a single DSSI bus (using the BC21Q-3F cable).

SCSI Configurations

The tabletop TZ86/TZ85 and pedestal SZ106/SZ100 can be configured:

- As a field add-on in a tabletop box or storage array pedestal on most systems that contain a SCSI-2 compliant interface port.
- Together with the KZBSA-CA BI-to-SCSI controller to provide a Tx800 family tape solution for the VAXBI installed base.

HSC-Based Configurations

The TA857/TA867 or SA106/SA100 can be configured:

- As a field add-on mounted as a full-rack configuration into an SA300 or SA900 cabinet (TA857 or TA867-AA/AB).
- As a field add-on pedestal option for all CI VAXcluster systems.
- Interfaced onto any HSC configuration—HSC40/50/60/70/90.

Tx800 Magazine and Cartridge Tape Family Specifications

Tx800 Family

Performance	
Data transfer rate (formatted)	0.8 Mbyte/second
Read/write speed	100 in./s, streaming
Transfer rate, raw	1.1 Mbytes/s
Sustained transfer rate, user data	
On DSSI bus	0.706 Kbyte/second
On SCSI-2 bus	0.600 Kbyte/second
On SCSI-2 bus with Infoserver	0.200 Kbyte/second
On HSC	0.550 Kbyte/second
Peak transfer rate	
On DSSI bus	4.0 Mbytes/s (synchronous mode)
On SCSI-2 bus	3.0 Mbytes/second (average)
On HSC	1.2 Mbytes/second
Repositioning time	1.3 seconds typical
Access time (with tape mark)	3 minutes maximum 1.5 minutes average
Cartridge load/unload cycle time with loader	38 seconds typical

Data Organization	
Recording format	48-track serial serpentine fixed block
Recording density	42,500 bits/inch
Recording method	MFM, bit serial data
Track density	96 tracks per inch
Read-write head	Two-channel ferrite, servo-controlled
Record size	Variable up to (64 Kbyte–1 byte), 4-Kbyte blocking factor
Tx85 maximum capacity	2.6 Gbytes (formatted)
Tx857 maximum capacity	18.2 Gbytes (formatted)

Supported Interfaces	
DSSI	TF85, TF857, SF100, TF86, TF867, SF106
SCSI-2	TZ85, TZ857, SZ100, TF867, SZ106
HSC	TA857, SA100, TA867, SA106

Tx85/Tx86

Physical Characteristics	Drive Only	Bezel	Total
Width	14.5 cm (5.7 in.)	14.9 cm (5.87 in.)	14.9 cm (5.8 in.)
Height (with controller mounted)	11.3 cm (4.5 in.)	8.6 cm (3.4 in.)	11.3 cm (4.5 in.)
Length (from back of bezel)	22.9 cm (9.0 in.)	1.5 cm (0.6 in.)	24.4 cm (9.6 in.)
Weight	3.2 kg (7 lb)		

Power Requirements	
Voltage	+5 V, +12 V, dc only
Power consumption	56.37 watts maximum, 29.74 watts typical, 35 watts average
Dissipation (maximum watts × 3.41)	192 Btu's
Line type	Molex 5129-4A

Tx85/Tx86 Tabletop

Physical Characteristics	
Height	14.52 cm (5.72 in.)
Width	23.49 cm (9.25 in.)
Length	33.22 cm (13.08 in.)
Weight (box only)	10 pounds, 1.5 ozs
Weight (box with drive)	16 pounds, 15 ozs

Power Requirements	
Nominal voltage	120 Vac/230 Vac
Minimum voltage	90 Vac/180 Vac
Maximum voltage	135 Vac/270 Vac
Power consumption	56.37 watts maximum, 29.74 watts typical, 35 watts average
Dissipation (maximum watts × 3.41)	192 Btu's
Line type	Single-phase AC, NEMA#515, IEC#320

Tx857/Tx867

Physical Characteristics	
Height	2.65 cm (10.42 in.)
Width	22.2 cm (8.74 in.)
Length	64.7 cm (25.50 in.)
Weight	25 kg (55 lb)
Power Requirements	
Nominal voltage	120 Vac/230 Vac
Minimum voltage	90 Vac/180 Vac
Maximum voltage	135 Vac/270 Vac
Power consumption	83.5 watts maximum, 82 watts typical
Dissipation (maximum watts × 3.41)	285 BTU's
Line type	Single-phase, ac, NEMA#515, IEC#320

Sx100/Sx106

Physical Characteristics	
Height	68.6 cm (27 in.)
Width	45.7 (18 in.)
Length	86.4 cm (34 in.)
Weight (box only)	72.7 cm (160 lb)
Weight (box with Tx857)	102.2 kg (225 lb)
Weight (box with Tx857 and Sx72)	111.8 kg (246 lb)
Power Requirements	
Nominal voltage	120 Vac/230 Vac
Minimum voltage	90 Vac/180 Vac
Maximum voltage	135 Vac/270 Vac
Power consumption	83.5 watts maximum, 82 watts typical
Dissipation (maximum watts × 3.41)	285 BTU's
Line type	Single-phase ac, NEMA#515, IEC#320

Cartridge

Physical Characteristics	
Width	10.5 cm (4.15 in.)
Height	2.54 cm (1.0 in.)
Length	11.3 cm (4.165 in.)
Weight	8 ozs
Tape	0.53-mil thick, 0.5-inch metal powder
Length	361.5 m (1186 ft) of usable tape
Cartridge	Digital-designed CompacTape III
Durability, magazine	10,000 insertions
Durability, cartridge	20,000 passes
Compatibility	TK50-K (TZ30,TK50), TK52-K (TK70) and TK85K

Magazine

Physical Characteristics	
Width	13.25 cm (5.217 in.)
Height	21.89 cm (8.622 in.)
Length	11.8 cm (4.646 in.)
Weight (empty)	0.59 cm (1.3 lb)
(fully loaded)	2.04 cm (4.5 lb)

TA91 Cartridge Tape Subsystem



The TA91 cartridge tape subsystem is the third member of the TA90 family of high-performance, IBM 3480/3490-compatible, tape storage subsystems for large computer systems. It replaces the TA90 and the TA90E subsystems.

The TA91 master tape subsystem cabinet holds one controller and either one or two tape drives. Slave drives may be added in two-drive increments, up to a maximum of eight drives attached to single controller. Slave drives are also packaged in 1.75-meter (69-inch) high cabinets.

The TA91 drive uses a standard 3480-compatible cartridge (200-Mbyte capacity) in an automatic six-cartridge stack loader. Improved Data Recording Capability (IDRC), a standard feature of the TA91 subsystem, increases the cartridge capacity two to four times. Improved capacity significantly increases the amount of data that can be backed up before an operator needs to reload the drive, improving backup efficiency. With IDRC enabled, a dual drive master can provide up to 9.6 Gbytes of unattended backup.

On VAXclusters, the TA91 subsystem connects to the HSC40/HSC50/HSC70 hierarchical storage controllers using the HSC5X-DA channel card, it connects to the KDM70 for use on single VAX 6000 and VAX 9000 systems.

Features

- 1.75-meter (69-inch) high cabinet with elevated swivel display for high visibility
- Dual-drive configuration has a 27 percent smaller footprint than the TA90 and TA90E subsystems
- 200 Mbytes per cartridge capacity, increases up to 800 Mbytes with IDRC depending upon type of data and application
- Full read/write compatibility with IBM 3480/3490 devices
- Full read/write compatibility with TA90 and TA90E devices
- Maximum data transfer rate: 2.6 Mbytes/second
- Rewind time: 48 seconds per cartridge
- Record density: 38,000 bits/inch
- Maximum configuration: two TA91 control units (masters) and 12 transport units per HSC or KDM70

Ordering Information

Note: TA91 enclosure is a 1.75-meter (69-inch) high cabinet.

TA91-AA/AB	Single-drive master tape unit with one controller and one drive, IDRC, one loader, and two BC27V-25 external cables. 3480-compatible. Connects to HSC or KDM70 controller. 200/208 V, 60 Hz/230/240 V, 50 Hz
TA91-BA/BB	Dual-drive master tape unit with one controller and two drives, IDRC, two loaders, and four BC27V-25 cables. 3480-compatible. Connects to HSC or KDM70 controller. 200/208 V, 60 Hz/ 230/240 V, 50 Hz.
TA91U-DA	Upgrade kit converts a single drive master (TA91-AA/AB) to a dual-drive master (TA91-BA/BB). Includes loader, two BC27V-25 external cables. 50/60 Hz.
TU91-BA	Dual-drive slave unit for use with TA91-BA. Includes two slave drives with loaders; expandable to a TU91-DA. 200/208 V, 60 Hz.
TU91-BB	Same as above except for use with TA91-BB. Expandable to TU91-DB. 230/240 V, 50 Hz.

Ordering Information
(Continued)

TU91-CA	Dual-drive slave unit for use with TA91-AA. Includes two slave drives with loaders, and two BC27V-25 external cables; expandable to a TU91-DA. 200/208 V, 60 Hz.
TU91-CB	Same as above except for use with TA91-AB. Expandable to TU91-DB, 230/240 V, 50 Hz
TU91-DA	Four-drive slave unit for use with TA91-BA. Includes four slave drives with loaders, 200/208 V, 60 Hz.
TU91-DB	Same as above except for use with TA91-BB, 230/240 V, 50 Hz
TU91-EA	Four-drive slave unit for use with TA91-AA. Includes four slave drives with loaders, two BC27V-25 external cables, 200/208 V, 60 Hz
TU91-EB	Same as above except for use with TA91-AB; 230/240 V 50 Hz
TU91U-DA	Upgrade kit converts a dual drive slave unit (TU91-BA or TU91-CA) to a four-drive slave unit (TU91-DA), 200/208 V, 60 Hz
TU91U-DB	Same as above except converts TU91-BB or TU91-CB to TU91-DB, 230/240 V, 50 Hz

Note: Products required for TA91 installation include one HSC5X-DA controller card for HSC40/50/70, VMS V5.4-2, HSC code V5.0A for HSC 40/70, HSC code V4.0 for HSC 50 and ULTRIX V4.2 and Russell Stoll 3754 receptacle. KDM70 required for direct connection of VAX 6000 or VAX 9000.

TU90 Dual-Drive Slave Unit

The TU90 dual-drive slave unit can be connected to either a TA90 or TA90E master subsystem. It allows customers who have existing TA90 or TA90E tape subsystems to add capacity while maintaining their current skyline. As many as three additional TU90 dual-drive store units can be connected to a single TA90/TA90E master subsystem.

Features

- Full IBM 3480 read/write compatibility
- Maximum data transfer rate: 2.6 Mbytes/second
- Rewind time: 48 seconds per cartridge
- Record density: 38,000 bits/inch
- Optional 6-cartridge automatic stack loader
- High reliability and high data integrity

Ordering Information

Maximum configuration is two TA90 control units (masters) and six dual-drive TU90 slaves.

TU90-AA/AB	Dual-drive slave cabinet, for use with TA90, 60 Hz/50 Hz
TU90-BA/BB	Dual-drive slave cabinet, with loaders, 60-Hz/50-Hz
TA90-FL	Cartridge loader option
TA90K-30	TA90 media (30 cartridges)
TA90K-HC	TA90 head cleaning cartridge (5)

TA90E Tape Subsystem Upgrade Kit

The TA90E master consists of one controller and two drive transports. TA90E combines the TA90 tape subsystem with an Improved Data Recording Capability (IDRC) feature. This feature increases the effective capacity of a TA90K cartridge so that more data may be backed up before an operator needs to reload the drive. Space required to store TA90 cartridges may also decrease as well as the number of mounts/dismounts on the drive, lowering the overall amount of time needed to complete backup.

TA90E and TA90 are read/write compatible except that cartridges written on the TA90E in IDRC mode may only be read on a TA90E or on an IBM 3480/3490 drive with IDRC. IDRC can be switched off so that a TA90E can be read/write compatible with a TA90 or IBM 3480/3490 subsystem that does not have IDRC.

Each TA90E dual drive subsystem is available with automatic stack loaders that hold six cartridges per loader. When upgrading to TA90E, only the master, or tape control unit, must be upgraded. All drives connected to an upgraded control unit can take advantage of the TA90E's capacity improvement.

The TA90E tape drive requires HSC software V5.0A to connect to the HSC40 and the HSC70. TA90E requires HSC software V4.0 to connect to and deliver full functionality on the HSC50. TA90E also requires VMS V5.3-2 or higher.

Features

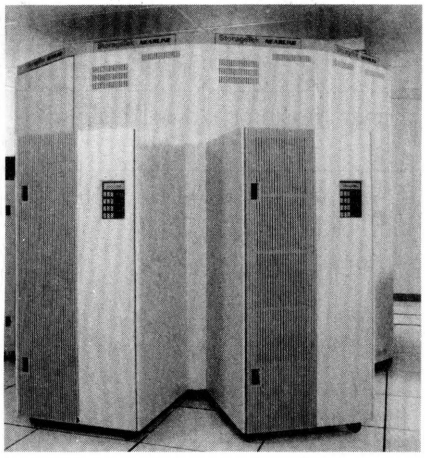
- Two to four times increase in effective cartridge capacity, depending on data type and application
- Maximum data transfer rate: 2.6 Mbytes/second
- Record density: 38,000 bits/inch
- Maximum configuration: two TA90E control units (masters) and 12 additional transport units per HSC or KDM70

Ordering Information

TA90E-UG	Upgrade kit to convert TA90 to TA90E; one per dual-drive master

Note: Products required for TA90E installation include one HSC5X-DA K.SI controller card for HSC40/50/70, V5.0A HSC code for HSC40/70, V4.0 HSC code for HSC50. VMS 5.3-2, or higher, and a Russell Stoll 3754 receptacle. KDM70 required for direct connection to a VAX 6000 or VAX 9000 system.

VAX to StorageTek 444 ACS Interconnect



VAX VMS to StorageTek connectivity products provide the ability to connect VAXclusters via an HSC, or VAXs via an XMI bus to the Storage Technology 4400 Automated Cartridge System (ACS), a high-availability automated tape library for IBM 3480 compatible cartridges. The ACS is a collection of up to 16 interconnected Library Storage Modules, each of which contains up to 6,000 cartridges at 200-Mbyte storage capacity per cartridge, providing access to up to 19,200 Gbytes (19.2 Terabytes) of near on-line storage. The 4400 ACS uses robotics and an optical scanning system to quickly and accurately locate and mount tape cartridges.

VAX to StorageTek 444 ACS Interconnect *(Continued)*

There are two ways to connect the StorageTek 4400 ACS to a VAX environment:

- The TC44 offers a connection through an HSC. This option is preferred by users accustomed to the features of a VAXcluster environment. HSC connected resources are shared equally across all CPUs in a VAXcluster.
- The KCM44 provides a direct connection to a VAX via the XMI bus. It offers maximum performance at 4.5-Mbyte-per-second burst rate, and supports dynamic sharing of tape drives within the ACS with other Digital and non-Digital hosts.

In both cases, DCSC software communicates over the Ethernet via TCP/IP to the 4400 ACS Library Server to manage the allocation of tape cartridges and drives.

Features

- Provides fast, automated access to tapes for unattended backup
- Provides access to 19.2 Terabytes or more of near on-line storage capacity
- Uses industry-standard IBM 3480/3490 tape cartridges
- Supported in a mixed CPU vendor environment

Prerequisites

Hardware

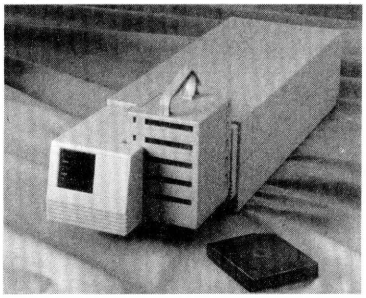
- StorageTek 4400 ACS components must be purchased separately
- For TC44 connection: HSC and two HSC5X-DA cards
- For KCM44 connection: two adjacent slots in an XMI backplane (restrictions apply)

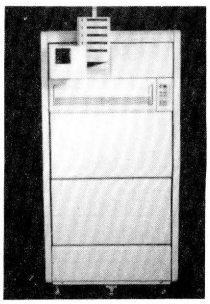
Software

- VMS V5.4-2 or later—if tape units under control of a KCM44 are to be served to the cluster, VMS V5.5 or later is required
- VMS ULTRIX Connection (for TCP/IP) V1.3 required for DCSC Control Path
  - DCSC Software Version 1.1
  - For TC44 connection: HSC software V5.0F or higher

Note: These products are available by custom quote only. For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

TKZ60 Cartridge Tape Drive





The TKZ60 is a third-party vendor labeled product that provides data interchange capability for VAXstations and DECsystems/DECstations via a SCSI interface and for VAX VMS Q-bus systems via an optional KZQSA. The TKZ60 is also available on all VAX 6000 systems with a VAXBI/XMI adapter (DWMBB).

This product is designed to meet the needs of customers who are currently using TA90 and IBM 3480 compatible media on other platforms within their business environment and have a requirement to exchange data between these platforms and their VAX workstations, DECsystems/DECstations Q-bus systems and VAXBI systems.

This cartridge tape drive uses the same 200-Mbyte tape cartridges as the TA90 and IBM 3480 drives. It is also compatible with STK 4480, Fujitsu M2480, and other 3480 format drives. It can be purchased with or without a sequential loader, providing an unattended capacity of 1 Gbyte with a 5-cartridge magazine, or 2 Gbytes with a 10-cartridge magazine.

The drive provides full 18-track, parallel recording with a thin-film head. The IBM IDRC compaction/compression algorithm, which is used to increase capacity in the TA90E and TA91, is not available for this SCSI/Q-bus drive at this time.

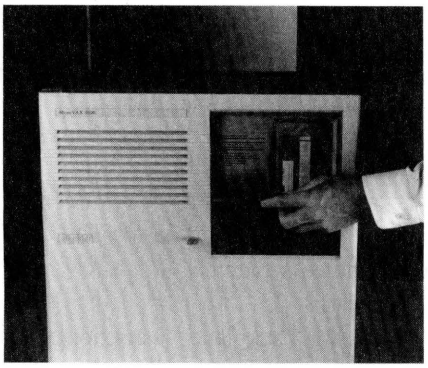
TKZ60 Cartridge Tape Drive *(Continued)*

Features

- Compact size—13.3 cm (5.25 in.) high × 21.7 cm (8.55 in.) wide × 54 cm (21.25 in.) deep
- Tabletop and rackmountable versions
- Available with or without sequential cartridge loader
- 5-slot and 10-slot cartridge magazines available

Note: This product is available by **custom quote only.** For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

TK70 Cartridge Tape Drives



The TK70, designed for use on VAX, MicroVAX, and DECsystem computer systems, is used for disk backup, software distribution, data collection, and data interchange between microsystems.

The subsystem consists of a tape drive (5.25-inch form factor), the dual-height Q-bus controller, and cables. Power supply and cabinetry are supplied by the system box in which the TK70 is mounted. The TK70 is not available in desktop or rackmount packages. The subsystem uses the CompacTape II cartridge (TK52-K), an enhanced version of the CompacTape cartridge. TK52-K cartridges should be used only with TK70 drives; TK50 users should continue to order TK50-K cartridges. Because the TK70 can read (but not write) TK50 formatted data, libraries of older cartridges can be read on the subsystem. Digital will continue to distribute software on TK50-K cartridges for both TK50 and TK70 subsystems.

Features

- Read/write speed: 100 inches/second, streaming
- Peak transfer rate: Total: 125 Kbytes/second, user data: 90 Kbytes/second
- Record size: Variable to (64 Kbytes minus 1 byte)
- Maximum capacity: 296 Mbytes (formatted)

Ordering Information

Controller and drive must be ordered separately (except for TF70C-JA).

TQK70-AA	TK70 controller and 76-cm (30-inch) cable for BA23.
TQK70-BA	TK70 controller and 76-cm (30-inch) cable for BA123.
TQK70-SA/SF	TK70 controller, 76-cm (30-inch) cable, and filler panel for BA2xx, BA4xx, and B400X; factory/field installed.
TK70-AA	TK70 drive for BA23 and BA123 (MicroVAX II), requires TQK70-AA/BA controller.
TK70E-AA/AF	TK70 drive for BA4xx and B400X. Requires TQK70; factory/field installed.
TK70E-SA/SF	TK70 drive for BA2xx systems and expansion pedestals; factory/field installed. Requires TQK70.
TF70C-AA	TK70 drive in removable canister. Includes controller. For VAXft Model 610/612 systems.
TF70C-JA	TK70 drive in removable canister for VAXft Models 310/410 systems. Includes controller.
TF70C-RA	TK70 drive for VAXft Model 110. Includes controller.
TK52-K	CompacTape II cartridge (296-Mbyte capacity).

Configuring Information

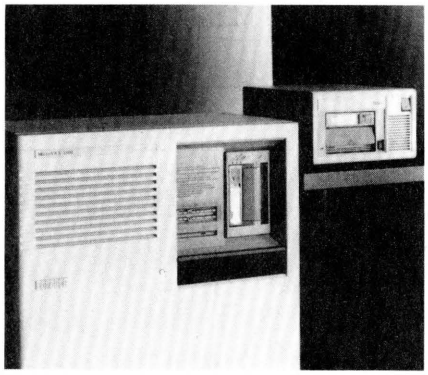
Option	Mounting Requirements	dc Amps @		Watts Drawn	Bus Loads Drawn		I/O Panel Insert Size
		5 V	12 V		ac	dc	
TK70-AA	N/A	1.4	2.4	35.8	0	0	N/A
TK70E-AA/AF	N/A	1.5	2.4	36.30	0	0	N/A
TK70E-SA/SF	N/A	1.5	2.4	36.30	0	0	N/A
TQK70-AA	Dual module	3.5	N/A	17.5	2.0	1.0	1(A)
TQK70-BA	Dual module	3.5	N/A	17.5	2.0	1.0	1(A)
TQK70-SA/SF	Dual module	3.5	N/A	17.5	4.3	0.5	N/A

Specifications

Physical Characteristics

	Without Bezel	With Bezel
Height	8.2 cm (3.23 in.)	8.6 cm (3.38 in.)
Width	14.5 cm (5.70 in.)	14.9 cm (5.88 in.)
Depth	21.4 cm (8.44 in.)	0.9 cm (0.35 in.)
Weight without cartridge		2.3 kg (5.0 lb)

TK50 Cartridge Tape Drives



The TK50 combines high reliability and data integrity with innovative, simplified streaming design. Its 95-Mbyte capacity makes it an ideal backup device for any of Digital's mini-Winchester disks. It fits into enclosures designed for 5.25-inch form factor storage devices. The CompacTape cartridge is a distribution medium for Digital's VAX software products, and the cartridge's capacity, small size, and ruggedness make it ideal for OEMs and end users who want to transport their own software or data.

Features

- Read/write speed: 75 inches/second, streaming
- Peak transfer rate: Total: 62.5 Kbytes/second, user data: 45 Kbytes/second
- Record size: Variable to (64 Kbytes – 1 byte)
- Maximum capacity: 95 Mbytes (formatted)

Ordering Information

All TK50 drives include a TK50-K cartridge.

TK50-AA	TK50 5.25-inch tape drive, 120 V (desktop model—no cables).
TK50-DA	TK50 in desktop unit, 120 V, includes 2.7-meter (9-foot) cable (BC06P-09).
TK50-DB	Same as above except 240 V; requires a country-specific power cord.
TK50-RA	TK50 in rackmount unit, 120 V, includes 2.7-meter (9-foot) cable (BC06P-09); Requires **H9302-00** rackmount installation kit
TK50-RB	Same as above except 240 V; requires a country-specific power cord.
TK50E-AA/AF	TK50 drive for BA4xx-series systems and expansion pedestals; factory/field installed.
TK50E-SA/SF	TK50 for BA2xx-series systems and expansion pedestals; factory/field installed.

Q-bus Controllers

TQK50-AA	Controller for TK50-AA. Includes 76.2-cm (30-inch) cable for BA23.
TQK50-BA	Controller for TK50-AA. Includes 76.2-cm (30-inch) cable for BA123.
TQK50-AB	Controller for TK50-Dx/Rx. Includes 35.6-cm (14-inch) cable and distribution insert for BA23.
TQK50-BB	Controller for TK50-Dx/Rx. Includes 53.3-cm (21-inch) cable and distribution insert for BA123 or BA11-M.
TQK50-CB	Controller for TK50-Dx/Rx. Includes 91.44-cm (36-inch) cable and bulkhead plate for H3490.
TQK50-PB	Controller for TK50-Dx/Rx. Includes 76.2-cm (30-inch) cable and bulkhead plate for H3490.
TQK50-RB	Controller for TK50-Dx/Rx. Includes 3.05-m (120-inch) cable and bulkhead plate for non-FCC-compliant cabinets.
TQK50-SA/SF	Controller for TK50E-SA/AA. Includes 91.44-cm (36-inch) cable; factory/field installed.

SCSI Subsystem

TK50Z-GA/G3	SCSI subsystem, TK50 controller expander box, 120 V/240 V for DECsystem 5100, VAXstation 3100, and MicroVAX 3100 systems.

Cartridge

TK50-K	CompacTape cartridge, 95-Mbyte capacity.

Power Cords

220/240-V devices require a power cord.

BN19A-2E	U.K./Ireland
BN19D-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19K-2E	Denmark
BN19N-2E	Italy
BN19U-2E	Israel

Configuring Information

Option	Mounting Requirements	dc Amps @		Watts Drawn	Bus Loads Drawn		I/O Panel Insert Size
		5 V	12 V		ac	dc	
TK50-AA	N/A	1.4	2.4	35.8	0.0	0.0	N/A
TK50-DA	N/A	0.0	0.0	0	0.0	0.0	N/A
TK50-RA	N/A	0.0	0.0	0	0.0	0.0	N/A
TQK50	Dual module	2.9	0.0	14.5	2.8	0.5	1(A)
TUK50	Quad module	3.0	0.0	15	4.2	0.5	1(A)

Specifications

Physical Characteristics

	Without Bezel	With Bezel
Height	8.2 cm (3.23 in.)	8.6 cm (3.38 in.)
Width	14.5 cm (5.70 in.)	14.9 cm (5.88 in.)
Depth	21.4 cm (8.44 in.)	0.9 cm (0.35 in.)
Weight without cartridge		2.3 kg (5.0 lb)

TZ30 Cartridge Tape Drive (SCSI)



The TZ30, a member of the TK family, is a 95-Mbyte streaming cartridge tape drive with embedded SCSI controller in a 5.25-inch, half-height, industry-standard form factor. It is designed for use as a software distribution and backup device on DECsystem 5100, MicroVAX 3100, VAXstation 4000, and VAXstation 3100 systems. The TZ30 is read/write compatible with the TK50. This feature allows software interchange within the entire range of Digital systems. The TZ30 includes design changes incorporated on the TK50 and TK70, such as the simplified front panel.

Features

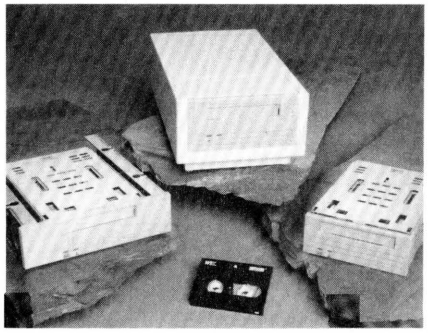
- 95-Mbyte formatted capacity
- 62.5-Kbyte/second transfer rate
- Operator interface similar to TK70 front panel
- Embedded SCSI interface

Ordering Information

Note: TZ30s are 95-Mbyte half-height cartridge tape drives.

TZ30-EG/EF	TZ30 with integral SCSI interface for MicroVAX 3100, DECsystem 5100, and VAXstation 3100 Models 40/48; includes TK50-K cartridge; factory/field installed
TZ30-EJ/EH	TZ30 for VAXstation 3100 Models 30/38 systems; factory/field installed
TZ30-EK/EL	TZ30 for MicroVAX 3100 Models 30/40/80/90; factory/field installed
TZ30-EM/EN	TZ30 for DECsystem 5900; factory/field installed
TZ30-UK	Upgrade for SZ16 expansion box
TZ30-UL	Upgrade for SZ12 expansion box

TLZ06 4-mm DAT Tape Drive (SCSI)



The TLZ06 tape drive is a 4-mm Digital Audio Tape (DAT) drive with a capacity of 4.0 Gbytes (with data compression) per cartridge and a SCSI-2 interface. At a lower price, this new drive is smaller, faster, and has a higher capacity than its predecessor, the TLZ04 tape drive.

The TLZ06 tape drive has a sustained transfer rate of 366 Kbytes/s in data compression mode for a typical backup of 1 Gbyte/hour. To provide for flexible configurations it is offered as an embedded device, in a slim 3.5-inch form factor or a 5.25-inch, half-height form factor. It is also offered in a standalone tabletop enclosure and in the SZ16 expansion box.

This second-generation DAT drive uses four direct-drive motors and a helical-scan, read-after-write recording technique to provide reliable data recording, with or without data compression (DC), on 60- or 90-meter data cassettes. The Digital Data Storage (DDS) recording format implements 10 distinct error-handling techniques, including three levels of error correction code (ECC) to ensure superlative data reliability.

The high 4.0-Gbyte capacity of the TLZ06 tape drive is achieved by a combination of a 90-meter cassette and typical 2× data compression. These features, combined with the Digital Data Storage recording formats (DDS-DC), ensure that interchangeability is retained as capacity increases. DDS-labeled media is required to ensure the highest data integrity during read/write operations.

Data compression is software selectable on the TLZ06 tape drive and can be turned off to read and write to 60-meter DAT tapes for interchange with the TLZ04 tape drive. However, it is important to remember that data compressed and recorded on 60-meter DAT cassettes by the TLZ06 drive cannot be read by the TLZ04 drive. The TLZ04 will **not** handle 90-meter DAT cartridges.

Features

- 366-Kbyte/s peak transfer rate (with data compression) for an unattended backup rate of 1-Gbyte/hour
- Q-bus compatible with KZQSA adapter
- VAXBI compatible with KZBSA adapter
- Supported on VMS V5.5-1, ULTRIX V4.2C, and SCO UNIX V3.2.4
- Read and write compatible with TLZ04
- Industry-standard DDS and DDS-DC formats for industry-wide data interchange

Ordering Information

System	Factory Installed (Embedded)	Field Installed (Embedded)	Tabletop
MicroVAX 3100 Model 10e	N/A	N/A	**TLZ06-FA**
MicroVAX 3100 Models 30/40/80/90	**TLZ06-HF**	**TLZ06-HG**	**TLZ06-FA**
VAX 4000 Model 100	**TLZ06-HF**	**TLZ06-HG**	**TLZ06-GA**
VAX 4000 Models 200/300/400/500/600[1]	N/A	N/A	**TLZ06-GA**
MicroVAX II and 3xxx[1]	N/A	N/A	**TLZ06-GA**
VAXstation 4000 VLC	N/A	N/A	**TLZ06-FA**
VAXstation 4000 Model 60/90	**TLZ06-GF**	**TLZ06-GG**	**TLZ06-FA**
DECsystem 5100	**TLZ06-FF**	**TLZ06-FG**	**TLZ06-FA**
DECsystem 5500	N/A	N/A	**TLZ06-GA**
DECsystem 5900	**TLZ06-LF**	**TLZ06-LG**	**TLZ06-FA**
DECstation 5000 Models 20/25/33	N/A	N/A	N/A
DECstation 5000 Models 120/125/133	**TLZ06-FM**	**TLZ06-FL**	**TLZ06-FA**
DECstation 5000 Models 200/240	N/A	N/A	**TLZ06-FA**
VAX 6000/VAX 8xxx	N/A	N/A	**TLZ06-RA**[2]
applicationDEC 400xP	**PS20R-LA**	**PS20R-LA**	**TLZ06-FA**
applicationDEC 433MP	**TLZ06-EF**	**TLZ06-EG**	**TLZ06-FA**

[1] Requires KZQSA adapter.
[2] Includes KZBSA adapter.

Notes: One media and cleaning cartridge included with all models. See SZ16 expansion box in this chapter for TLZ06 expansion box configurations and ordering information.

Accessories and Supplies

TLZ04-HA	Cleaning cartridge for TLZ04 and TLZ06
TLZ06-CB	Five-pack of 9-m data cartridges

KZQSA Adapter

KZQSA-AA	TLZ06 adapter for BA23 MicroVAX II systems
KZQSA-BA	TLZ06 adapter for BA123 MicroVAX II systems
KZQSA-CA	TLZ06 adapter for DECsystem 5500 system (optional)
KZQSA-SA/SF	TLZ06 adapter for BA200/BA400 MicroVAX 3000 and VAX 4000 systems; factory/field installed

Power Cords

240-V devices require a country-specific power cord.

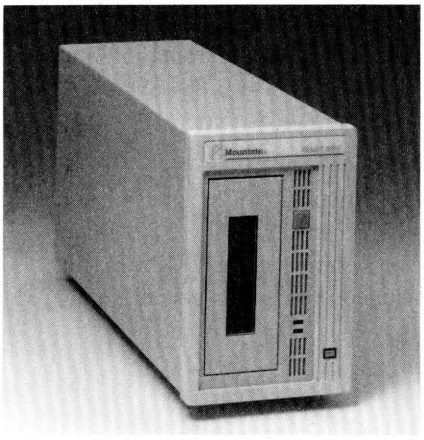
BN19A-2E	U.K./Ireland
BN19C-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia/New Zealand
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India
BN18U-2E	Israel

Specifications

Physical Characteristics

	3.5-Inch Embedded	5.25-Inch Embedded	Tabletop
Height	4.1 cm (1.6 in.)	4.1 cm (1.6 in.)	8.6 cm (3.4 in.)
Width	10.1 cm (4.0 in.)	14.6 cm (5.7 in.)	13.5 cm (5.3 in.)
Depth	15.2 cm (6.0 in.)	18.0 cm (7.1 in.)	23.6 cm (9.3 in.)
Weight	0.9 kg (2.0 lb)	1.1 kg (2.4 lb)	2.4 kg (5.2 lb)

TKZ08 Helical Scan Tape Drive (SCSI)



The TKZ08 is an 8-millimeter helical scan tape drive with SCSI interface for data backup, storage and data interchange that uses an Exabyte tape drive. It comes in a tabletop enclosure and provides the ability to record up to 2.2 Gbytes of formatted data per cartridge, using the helical scan recording techniques. The drive's raw transfer rate is 246 Kbytes per second. The TKZ08 is supported on DECstation 3100, DECstation 2100, DECstation 5000 Models 120/125, Model 200, DECsystem 5100 and 5500 systems. It is supported by ULTRIX V3.1d/V4.0/4.1/4.2. It is available in the U.S. only.

Note: The TKZ08 is the Mountain Network Solutions, Inc. FileSafe 2100D. The drive will remain third-party vendor labeled and is packaged with vendor documentation. Supports single tape operations of 2.2 Gbytes or less.

Features

- Tabletop enclosure
- Capacity per tape cassette: 2.2 Gbytes
- Raw data transfer rate: 246 Kbytes/second
- Read/write speed: 150 inches/second (effective tape to head speed)

Ordering Information

TKZ08-AA	2.2-Gbyte cartridge tape drive in tabletop enclosure; 50-50 pin connecting cable for daisy chaining; includes one data cartridge, one cleaning cartridge, and 120-V power cord.
TKZ8X-CB	Boxed five-pack of 2.2-Gbyte data cartridge tapes.

Note: For additional information, call the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

TKZ09 Helical Scan Tape Drive



The TKZ09 is an Exabyte 8-mm helical scan tape drive with SCSI interface for unattended backup, storage, and data interchange. It provides the ability to record up to 5 Gbytes of formatted data per cartridge. It has a sustained transfer rate of up to 500 Kbytes/second. The TKZ09 can write to cartridges in 2-Gbyte format or in 5-Gbyte format, providing read and write compatibility with 2-Gbyte 8-mm cartridge drives, including the TKZ08 and TLZ08.

The TKZ09 is offered as a tabletop device supporting direct SCSI VMS systems: VAXstation 4000 Models 60 and VLC, VAXstation 3100 Models 30, 38, 40, 48, 76 and MicroVAX 3100 Models 10e, 30, 40 and 80.

The TKZ09 can also be mounted in a 5.25-inch slot in the Mass Storage Drawer (MASA) of the DECsystem 5900 cabinet. A field-installable version is also available for existing DECsystem 5900 systems.

Features

- Capacity per cartridge: 5 Gbytes formatted
- Raw data transfer rate: 500 Kbytes/s sustained, 4 Mbytes/s burst
- Read/write compatibility: EXB-8500 and EXB-8200

Prerequisite Software

- VMS V5.5 and later
- ULTRIX V4.2C

Note: The TKZ09 is available by custom quote only. For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

TLZ08 Helical Scan Tape Drive (SCSI)

The TLZ08 is an 8-millimeter helical scan tape drive with SCSI interface for data backup, storage, and data interchange. It is based on the Exabyte 8200 tape drive and supports single tape operations. For systems with a VAXBI bus, a VAXBI-to-SCSI adapter for tape drives is included. For Q-bus systems, a KZQSA adapter is required.

Features

- Tabletop or rackmount enclosure
- Dual 16-character status display
- Single- or dual-drive capability
- Capacity per tape cassette: 2.2 Gbytes
- Peak data transfer rate: 246 Kbytes/s

Prerequisites

Hardware

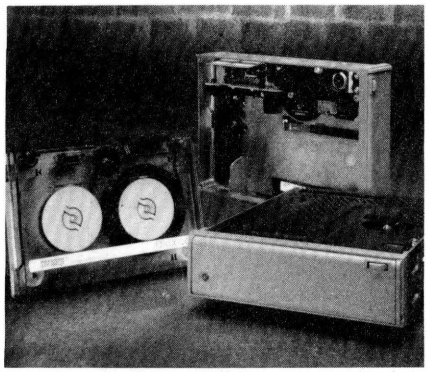
- For VAXBI, one available VAXBI slot
- For Q-bus, a KZQSA adapter

Software

- VAX VMS V5.3-2 or later
- VAX ULTRIX V4.2 or later

Note: These products are available by **custom quote only.** For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

TZK10 Quarter-Inch Cartridge (QIC) Tape Drive (SCSI)



The TZK10 tape drive is an industry-standard quarter-inch cartridge (QIC) streaming tape device, with a capacity of up to 525 Mbytes. It uses a 5.25-inch, half-height form factor. Used for backup and data interchange, the TZK10 can read and write according to the following tables. The TZK10 tape drive is used for backup and data interchange.

Cartridge	System	Capacity	Format	Read	Write
DC6525	ULTRIX, VMS	Up to 525 Mbytes	QIC 525	X	X
DC6320	ULTRIX, VMS	Up to 320 Mbytes	QIC 320	X	X
DC6150 or DC600XTD	ULTRIX	Up to 150 Mbytes	QIC 150	X	X
DC6150 or DC600XTD	ULTRIX	Up to 120 Mbytes	QIC 120	X	X
DC600A	ULTRIX	Up to 60 Mbytes	QIC 24	X	

Features

- Both 320-Mbyte and 525-Mbyte (formatted) tape capacities
- 200-Kbyte/second transfer rate
- 5.25-inch half-height form factor
- Embedded and tabletop models
- Read/write speed: 120 inches/second streaming
- Supported interface: SCSI
- Supported in ULTRIX V4.1, VMS V5.4-2, and SCO UNIX

Ordering Information

Note: TZK10s are 525-Mbyte QIC-tape-embedded drives.

TZK10-FF/FG	TZK10 for DECsystem 5100 system and MicroVAX/VAXserver 3100 Models 10e/20e; factory/field installed. **Note:** MicroVAX 3100 Models 10e/20e ordered without factory-installed TZK10 cannot have TZK10 installed at a later date.
TZK10-EF/EG	TZK10 for applicationDEC 433MP; factory/field installed.
TZK10-FM/FL	TZK10 for DECstation 5000 Models 125/133; factory/field installed.
TZK10-HF/HG	TZK10 for MicroVAX 3100 Models 30/40/80/90; VAX 4000 Model 100; factory/field installed.
TZK10-LF/LG	TZK10 for DECsystem 5900; factory/field installed
TZK10-GF/GG	TZK10 for VAXstation 4000 Model 60/90; factory/field installed.
PCXAT-AA	TZK10 for DECpc 433W, DECpc 433T, and DECstations 3xx/4xx running under SCO UNIX. Includes SCO UNIX driver and documentation.
PCXAT-AB	TZK10 for DECpc 433W, DECpc 433T, and DECstations 3xx/4xx running under DOS. Includes DOS driver and documentation.
PCXAT-AC	TZK10 for DECpc 433W, DECpc 433T, and DECstations 3xx/4xx running under OS/2. Includes OS/2 driver and documentation.

Notes: One media and one cleaning cartridge included in all models; also available in SZ12/SZ16 dual-drive expansion boxes.

Ordering Information
(Continued)

Accessories and Supplies

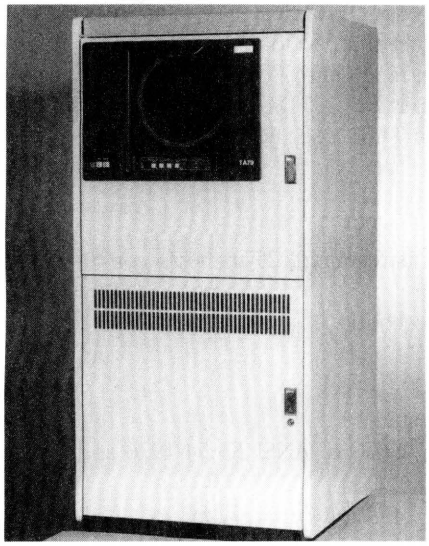
TZK1X-HA	TZK10 cleaning cartridge.
TZK1X-CB	5-pack, 320-Mbyte QIC media cartridges (DC6320)
TZK1X-CD	5-pack, 525-Mbyte QIC media cartridges (DC6525)

Specifications

Physical Characteristics (embedded)

Height	4.40 cm (1.75 in.)
Width	15.00 cm (5.9 in.)
Depth	21.80 cm (8.6 in.)
Weight	1.1 kg (2.4 lb)

TA79 Magnetic Tape Subsystem



The TA79 tape subsystem is a rugged and reliable, autoloading high-performance tape companion for systems with large amounts of disk storage. The TA79 is packaged with its formatter in a single cabinet that is radially connected to the HSC5X-CA or -DA interface in the HSC storage servers or to the KDM70 disk/tape controller. For operation above 610 meters (2,000 feet), a high altitude kit must be installed. Note that adding a TA79 requires minimum revision levels of software and microcode.

Features

- Read/write speed: 125 inches/second
- Maximum data transfer speed: 200 Kbytes/second (phase encoded), 781 Kbytes/s (Group Code Recording)
- Rewind speed: 440 inches/second
- Rewind time: 65 seconds per 731.5 m (2,400 ft)
- Number of tracks: 9 on 0.5-inch magnetic tape
- Recording method: Group Code Recording (GCR) to ANSI X3.54-1976 and phase encoded (PE) to ANSI X3.39-1973
- Record density: 6,250 bits/inch (GCR), and 1,600 bits/inch (PE)
- Capacity: 145 Mbytes (GCR), 40 Mbytes (PE)
- TA79 tapes per HSC5X-DA interface: four; per KDM70: two
- TU79 add-ons per TA79 tape: three

Ordering Information

TA79-BF/BJ	High-density magnetic tape subsystem *Prerequisite:* HSC40/50/70 with HSC5X-DA or KDM70
TU79-AF/AJ	TU79 add-on tape transport
TA78-UG	TU78 master to TA78 upgrade kit*
TU79K-EA	Cabinet kit for adding TU79 to TA/TU78 string
TU79K-EB	Cabinet kit for adding TU78 to TA/TU79 string

* All drive options include cables.

Specifications

Physical Characteristics	
Height	153.0 cm (60.3 in.)
Width	66.7 cm (26.3 in.)
Depth	76.2 cm (30.0 in.)
Weight	254.2 kg (560.0 lb)
Power Requirements	
Current (ac amps)	7.8
Watts	1500
Btu/h	5118
KJ/h	5399
NEMA receptacle type	L6-30R
PCS+/PDS+ cable type	BC26E (120/208) BN29K (240/416)
Number of phases	1

TA81 Magnetic Tape Subsystem



The TA81 is a low-cost, entry-level tape drive for VAXcluster systems. It is packaged with its formatter in a single cabinet that is radially connected to the HSC5X-CA or -DA interface or KDM70 disk/tape controller. It has one transport per formatter, supporting four TA81 tapes per HSC5X-DA or HSC5X-CA and two interfaces per KDM70. Unlike the TA79, the TA81 does not support slave transports.

Features

- Read/write speed: 75 and 25 inches/second (streaming), 25 inches/second (start/stop)
- Maximum data transfer speed: 468 Kbytes/second
- Rewind speed: 192 inches/second
- Rewind time: 2.5 minutes per 731.5-m (2,400-ft) reel
- Number of tracks: 9 on 0.5-inch magnetic tape
- Recording method: Group Code Recording (GCR) to ANSI X3.54-1976 and phase encoded (PE) to ANSI X3.39-1973
- Record density: 6,250 bits/inch (GCR), and 1,600 bits/inch (PE)
- Capacity: 145 Mbytes (GCR), 40 Mbytes (PE)

Ordering Information

TA81-AA/AB	TA81 magnetic tape subsystem; includes two SDI cables
TA81-UG	TU81 or TU81E to TA81 upgrade kit

Specifications

Physical Characteristics	
Height	106.0 cm (41.6 in.)
Width	54.0 cm (21.3 in.)
Depth	76.2 cm (30.0 in.)
Weight	106.0 kg (235.0 lb)

Power Requirements	
Current (ac amps)	5.2
Watts	500
Btu/h	1030
NEMA receptacle type	l5-30R
IEC receptacle type	
PCS+/PDS+ cable type	BC24S (120/208); BN29K (240/416)
Number of phases	1

TU81-Plus Magnetic Tape Subsystem



The TU81-Plus is a high-density, industry-compatible, magnetic tape subsystem for VAX 4000, MicroVAX 3300, DECsystem 5500, and VAX 6000 systems with high-capacity disks. It includes a VAXBI, Q-bus, or UNIBUS compatible controller (one transport per controller) and a 256-Kbyte cache buffer that dramatically increases its backup performance as compared to the TU81. An entry-level Group Code Recording (GCR) drive, the TU81-Plus offers low cost of ownership and high reliability.

Features

- Read/write speed: 75 and 25 in./s (streaming), 25 in./s (start/stop)
- Rewind speed: 192 in./s
- Maximum data transfer speed: 468 Kbytes/s
- Rewind time: 2.5 minutes per 731.5 m (2,400-ft) reel
- Number of tracks: nine on 0.5-inch magnetic tape
- Recording method: Group Code Recording to ANSI X3.54-1976 and phase encoded (PE) to ANSI X3.39-1973
- Record density: 6,250 bits/in. (GCR), and 1,600 bits/in. (PE)
- Capacity: 145 Mbytes (GCR), 40 Mbytes (PE)
- Transports per controller: one

Ordering Information

TU81E-AA/AB	TU81-Plus with UNIBUS controller; 120-V/240-V
TU81E-BA/BB	TU81-Plus with VAXBI controller; 120-V/240-V
TU81E-DA/DB	TU81-Plus with Q-bus controller (KLESI) for BA23 or BA123 enclosures; 120-V/240-V
TU81E-SA/SB	TU81-Plus with Q-bus controller (KLESI) for BA2xx and BA4xx enclosures; factory installed; 120-V/240-V
TU81E-SF/SG	TU81-Plus with Q-bus controller (KLESI) for BA2xx and BA4xx enclosures; field installed; 120-V/240-V
TU81E-UG	TU81 to TU81E upgrade kit

Note: A standard 25-pin, 6.1-m (20-ft) cable is included with all drive options. No other cable options are available.

Power Cords

120-V power cord included with 120-V models. 240-V devices require the purchase of a country-specific power cord.

BN18B-4E	U.K./Ireland
BN18D-4E	Australia/New Zealand
BN18E-4E	Italy
BN18F-4E	Israel
BN18H-4E	India
BN18T-4E	Canada/Japan/U.S.
BN18P-4E	Denmark
BN18C-4E	Switzerland, Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, and Spain

Configuring Information

Option	Slots	dc Amps Drawn @			Watts Drawn	Bus Loads Drawn	I/O Panel Units
		5 V	15 V	−15 V		dc	
TU81E-Ax	1 quad slot	4.0	0.0	0.0	20	1.0	1
TU81E-Dx	1 dual slot	3.0	0.0	0.0	15	1.0	1A
TU81E-Sx	1 dual slot	4.0	0.0	0.0	20	0.5	1.0

Option	Slots	dc Amps Drawn @					VAXBI Nodes	I/O Panel Units
		5 V	12 V	−12 V	−5.2 V	−2 V		
TU81E-Bx	1 VAXBI slot	7.0	0.0	0.0	0.0	0.0	1	1

Specifications

Physical Characteristics

Height	106.0 cm (41.6 in.)
Width	54.0 cm (21.3 in.)
Depth	76.2 cm (30.0 in.)
Weight	106.0 kg (235.0 lb)

Power Requirements

Watts	500
Btu/h	1024
NEMA receptacle type	L5-30R
IEC receptacle type	Schuko/CEE7-7
PCS+/PDS+ cable type	BC24S (120/208) BN29K (240/416)
Number of phases	1

TS05 Family of Magnetic Tape Subsystems

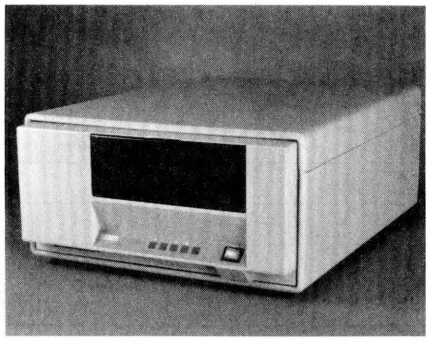


The TS05 family includes low-cost industry-standard magnetic tape drives. Data on the TS05 drives can be interchanged with any system that uses half-inch, ANSI 9-track 1600-bit/inch tape in phase-encoded format. The TSV05 is for Q-bus systems, including the DECsystem 5400 and 5500. The TSU05 is for UNIBUS systems. Both the TSV05 and TSU05 require 22-cm (8.7-in.) in an H9642-type 106-cm (41.7-in.) high cabinet. They are also available for rack-mounting. The TSZ05 offers a Small Computer Systems Interface (SCSI) and is packaged in a tabletop enclosure.

Features

- Recording density: 1,600 bits/inch
- Capacity per 731.5-m (2,400-ft) reel: 40 Mbytes with 8-Kbyte blocks at 1,600 bits/inch
- Number of tracks: nine on 0.5-inch magnetic tape
- Data transfer rate (maximum): 40 or 160 Kbytes/second
- Read/write speed: TSV05/TSU05: 25 in./s; TSZ05: 100 in./s
- Rewind speed (maximum): TSV05/TSU05: 180 in./s; TSZ05: 175 in./s

Ordering Information



Notes: TSV05 model numbers are 100 V/120 V/220 V/240 V. 120-V models include 120-V power cord; all others require the purchase of a country-specific power cord; contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990 for more information.

TSV05-AC/AA/AD/AB*	For BA23-based Q-bus systems; includes controller and mounting hardware
TSV05-ZC/ZA/ZD/ZB	For MicroVAX II Models DH-630Q5, DH-630Q6, DJ-630P5, and 630QE deep cabinet systems; includes controller, cables, top access cover, and mounting hardware
TSV05-BC/BA/BD/BB*	For BA23- or BA123-based Q-bus systems; magtape in 106-cm (41.7-in.) H9642 cabinet that includes 53.3-cm (21-in.) expansion space, includes controller and side panels. **Note:** H9544-DD (5.25-in. shielded front cover) is required when mounting BA23 enclosure in TSV05-Bx cabinet
H9644-DD	5.25-in. shielded front cover; required when mounting BA23 enclosure in TSV05-Bx cabinet
TSV05-SC/SA/SD/SB	For BA4xx- and BA2xx-based systems; includes controller, cables, and mounting hardware
TSV05-SH/SE/SJ/SF	For BA4xx- and BA2xx-based systems; magtape in 106-cm (41.7-in.) H9642 cabinet that includes 53.3-cm (21-in.) expansion space, includes controller, side panels, and cables
TSV05-SM/SK/SN/SL	For VAXserver 3602 BA2xx-based systems; includes controller, cables, mounting hardware, and top access cover for top mounting in system cabinet

* Requires the purchase of a cable kit from the following list.

Ordering Information
(Continued)

Note: TSU05 model numbers are 120 V/240 V.

TSU05-AA/AB	For UNIBUS systems; includes control module, cables, and mounting hardware
TSU05-BA/BB	For UNIBUS systems; magtape in 106-cm (41.7-in.) H9642 cabinet, includes control module and cables

Note: TSZ05 model numbers are 100 V/120 V/220 V/240 V

TSZ05-AC*/AA/AD*/AB* SCSI magnetic tape system in tabletop enclosure.

* Requires the selection of a country kits from the following list.

CPU Enclosures/Cable Chart (BA23 Enclosures only)

TSV05 System	BA23	BA123	H9642 Std Cab	OEM Configuration	H9642 Deep Cab
TSV05-AA, AB, AC, AD	CK-TS05-14	CK-TS05-11	CK-TS05-14	CK-TS05-12	CK-TS05-13*
TSV05-BA, BB, BC, BD	CK-TS05-14	CK-TS05-11	CK-TS05-14	CK-TS05-12	CK-TS05-11
TSV05-ZA, ZB, ZC, ZD	N/A	N/A	N/A	N/A	N/A

* If H9642 is an expansion cabinet, use CK-TS05-11.

Country Kits

-AB, -AC, and -AD configurations require country kits which include: country-specific ac power cord, 50-pin to 50-pin SCSI cable, 68-pin to 50-pin SCSI cable, SCSI terminator, installation guide, and user's guide.

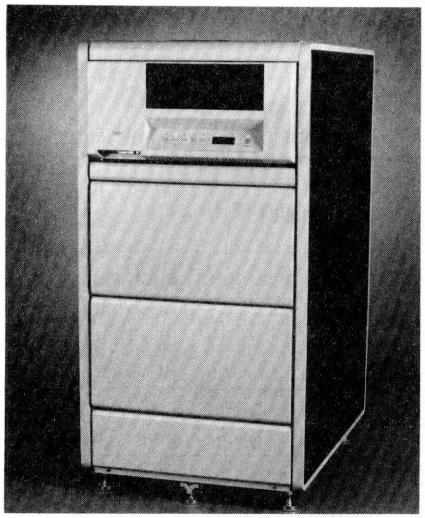
TSZ05-KA	U.S./Canada
TSZ05-MA	Austria, Belgium, Finland, France, Netherlands, Norway, Portugal, Spain, and Sweden
TSZ05-KD	Denmark
TSZ05-KE	U.K./Ireland
TSZ05-KG	Germany
TSZ05-KI	Italy
TSZ05-KJ	Japan
TSZ05-KK	Switzerland
TSZ05-LJ	India
TSZ05-KT	Israel
TSZ05-KZ	Australia/New Zealand

Note: For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

Configuring Information

Option	Mounting Requirements	dc Amps @		Watts Drawn	Bus Loads Drawn		I/O Panel Insert Size
		5 V	12 V		ac	dc	
TSV05-AA/AB	1 quad slot	6.5	0.0	32.5	3.0	1.0	2(A)
TSV05-BA/BB	1 quad slot	6.5	0.0	32.5	3.0	1.0	2(A)
TSV05-ZA/ZB	1 quad slot	6.5	0.0	32.5	3.0	1.0	2(A)
TSV05-SA/SB	1 quad slot	2.5	0.0	12.5	3.0	1.0	N/A
TSV05-SE/SF	1 quad slot	2.5	0.0	12.5	3.0	1.0	N/A
TSV05-SK/SL	1 quad slot	2.5	0.0	12.5	3.0	1.0	N/A

TSZ07 Magnetic Tape Drive (SCSI)



The TSZ07 is a dual-density 1600/6250-bit/inch magnetic tape drive that can be connected to SCSI workstations using the built-in SCSI 2 interface, and to Q-bus MicroVAX systems via the KZQSA adapter, to provide industry-standard 9-track data interchange (one TSZ07 per KZQSA). The TSZ07 can be connected to DECsystem 5500 systems using the embedded SCSI adapter or to Q-bus systems using the KZQSA adapter. The TSZ07 is also available on all VAX 6000 systems with a VAXBI/XMI adapter (DWMBB). The TSZ07 is available in a standard 48.3-cm (19-inch) rackmount form, in a tabletop version, or top mounted in a 1-meter (40-inch) cabinet which includes an 874-type power controller and provides 53.3 cm (21 inches) of cabinet expansion space.

Features

- Recording density: 6250 bits/inch (GCR), 1600 bits/inch (phase encoded)
- Formatted capacity @ 6250 bits/inch: 140 Mbytes (2400-foot reel), @ 1600 bits/inch: 40 Mbytes (2400-foot reel)
- Read/write speed: 2.54 meters/second (100 inches/second) (maximum)
- Maximum rewind speed: 5.1 meters/second (200 inches/second)
- Maximum data transfer rate: 625 Kbytes/second
- Maximum SCSI transfer rate: 4 Mbytes/second (synchronous)
- Automatic loading and threading
- 8-character alphanumeric front panel display
- 1 Mbyte of cache memory
- Front loading with low-profile 22.2-cm (8.75-inch) height
- Auto-ranging power supply
- Low acoustic noise level

Ordering Information

Order the following for direct SCSI or Q-bus (KZQSA required for Q-bus) connection:

TSZ07-AA*	1600/6250-bit/in. SCSI rackmountable 9-track magtape
TSZ07-BA	1600/6250-bit/in. SCSI 9-track magtape mounted in H9642 cabinet, includes 9-ft (2.7-m) external cable (BC06P-09), and 120-V power cord
TSZ07-BB†	Same as above except 240 V
TSZ07-CA*	1600/6250-bit/in. SCSI tabletop 9 track magtape

Order the following for VAXBI connection:

TSB07-AA*	Differential rackmountable magtape; includes VAXBI adapter, internal cable, I/O bulkhead with connector, and 25-ft (7.6-m) external cable (BC13N-25)
TSB07-BA	Differential rackmountable magtape; includes VAXBI adapter, internal cable, I/O bulkhead with connector, 25-ft (7.6-m) external cable (BC13N-25), and 120-V power cord
TSB07-BB†	Same as above except 240 V
TSB07-CA*	Differential rackmountable magtape; includes VAXBI adapter, internal cable, I/O bulkhead with connector, and 25-ft (7.6-m) external cable (BC13N-25)

Ordering Information
(Continued)

For daisychaining off a VAXBI system, order one TSB07 above and one TSZ07 differential SCSI model below:

TSZ07-DA*	Differential SCSI rackmountable 9-track magtape
TSZ07-EA	Differential SCSI 9-track magtape in H9642 cabinet, includes 9-ft (2.7-m) external cable (BC06P-09), and 120-V power cord
TSZ07-EB†	Same as above except 240 V
TSZ07-FA*	Differential SCSI tabletop 9-track magtape

* Order country kit separately
† Order power cord separately

Country Kits

TSZ07-AA/CA/DA/FA and TSB07-AA/CA require one of the following country kits which include an ac power cord, two 1.8-m (6-ft) SCSI cables (BC06P-06 and BC56H-06), hardware documentation, tape head cleaning kit, and 731.5-m (2400-ft) reel of blank magnetic tape.

TSZK7-AA	U.S./Canada/Mexico
TSZK7-AD	Denmark
TSZK7-AE	U.K./Ireland
TSZK7-AG	Austria, Belgium, Finland, France, Netherlands, Norway, Portugal, Spain, and Sweden
TSZK7-AI	Italy
TSZK7-AJ	Japan
TSZK7-AK	Switzerland
TSZK7-AT	Israel
TSZK7-AZ	Australia/New Zealand
TSZK7-BJ	India

Power Cords

The TSZ07-BA/BB/EA/EB and TSB07-BA/BB include a SCSI cable, documentation, cleaning kit, and blank magnetic tape reel. 240-V options (-xB) require a power cord from the following list:

BN18B-4E	U.K./Ireland
BN18D-4E	Australia/New Zealand
BN18E-4E	Italy
BN18F-4E	Israel
BN18H-4E	India
BN18T-4E	Canada/U.S./Japan (100/120 V)
BN20B-2E	Canada/U.S./Japan (240 V)
BN18P-4E	Denmark
BN18C-4E	Austria, Belgium, Finland, France, Netherlands, Norway, Portugal, Spain, and Sweden

Specifications

Physical Characteristics

	TSx07-AA/DA	TSx07-Bx/Ex	TSx07-CA/FA
Height	22.8 cm (9.0 in.)	111.1 cm (43.75 in.)	26.9 cm (10.6 in.)
Width	43.2 cm (17.0 in.)	59.7 cm (23.5 in.)	50.8 cm (20.0 in.)
Depth	63.5 cm (25.0 in.)	83.8 cm (33.0 in.)	68.6 cm (27.0 in.)
Weight	30.9 kg (68.0 lb)	115.9 kg (255 lb)	43.2 kg (95 lb)

Note: For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

Chapter 8
Terminals and Printers

Windowing Terminals

Video Terminals

Scanners

Printers

Printer Software

Video Terminals Introduction

Overview

Digital's high-performance, high-quality terminals improve user productivity, enhance system performance, and promote improved communications and network performance.

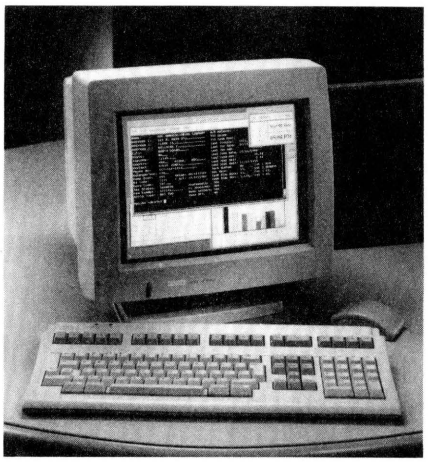
The VXT 2000 family of X Window System terminals combines superior graphics capability with easy application access in a single video display terminal. The VXT family includes color, monochrome, and grayscale models in 15-, 17-, and 19-inch monitor sizes, as well as a low-cost, compact single-box 15-inch monochrome model. It offers both host-based and server-based modes of operation. Server-based mode provides enhanced system management, virtual memory management, and font management capabilities.

The VT420 is a text terminal with many ergonomic and functional enhancements. The VT420 replaces the VT320 and offers text windowing, six pages of memory, up to 50 display lines, and dual sessions.

The VT420 with PCTerm is a full-featured alphanumeric terminal that supports the PC character set and scan codes for multiuser DOS and DOS applications running under UNIX.

The VT340$^+$ is a color graphics dual-session terminal. The VT340$^+$ is for users who require high-performance, full-color business and preview graphics, as well as high-quality text display capabilities.

VXT 2000 Windowing Terminals



The VXT 2000 is an open desktop device that provides a window into the network—and easy access to its many resources, applications, and databases. Because it is system independent, the VXT 2000 can be used in any multivendor environment that requires users to share data among multiple applications located on different hosts and supporting a variety of operating systems.

The VXT 2000 is available in two complementary software models that share core functionality—Host-based and Server-based. The Host-based model down-line loads the VXT 2000 software from a UNIX, ULTRIX, or VMS host. The Server-based model uses the InfoServer 100 or InfoServer 150 (when upgraded with VXT software), or the InfoServer 150VXT—specifically designed for use with VXT 2000 windowing terminals. The InfoServers provide virtual memory capability, high-speed font access, and facilitate the establishment and management of terminal work groups performing similar tasks.

The VXT 2000 family of X terminals includes monochrome, grayscale and color two-box models in 15-, 17- and 19-inch monitor sizes and a 15-inch monochrome single-box model; the 8-plane color and grayscale models include a graphics coprocessor for high-performance graphics. The DECimage option is a low-cost plug-in board that turns any two-box VXT terminal into a high-performance image display system.

Features

- Server-based and host-based modes of operation provide flexibility for different operating environments.
- Runs multiple terminal and X Window System applications simultaneously—from UNIX, ULTRIX, or VMS operating systems.
- Industry-standard OSF/Motif graphical user interface provides a common user interface for applications.
- Easy work group configuration and font management provided in server-based mode of operation.
- Powerful, industry-standard imaging capabilities are integrated with the X Window System environment, and are available through the DECimage option on all two-box models.
- TCP/IP, LAT, and LASTport communications protocols, supported over 802.3/Ethernet thick wire, 802.3/Ethernet ThinWire, or Twisted Pair (10BaseT) provide easy interface to existing networks.
- Booting flexibility: load from UNIX, ULTRIX, or VMS systems.
- 4-Mbyte standard terminal memory; expandable to 16 Mbytes.
- Three-button mouse (200 pulses per linear inch) and mousepad.
- Choice of keyboards—including a keyboard tailored for UNIX environments.
- Autostart capability for quick access to most frequently used hosts and applications.

Prerequisites

Host Systems

- VAX system running VMS V5.4.2 or later, or ULTRIX V4.2
- RISC system running ULTRIX V4.2
- SUN system running SunOS V4.1.1
- Hewlett-Packard system running HP-UX V8.05

Server Systems

- InfoServer 100 or InfoServer 150 (upgraded with VXT 2000 software)
  OR
- InfoServer 150VXT (see Step 3 for details)

Ordering Information—Note that Steps 1, 2, 3, and 4 are required.

Step 1—Select Terminal

Notes: VX215-xx/xx/xx, VX217-xx/xx/xx, or VX225-xx/xx/xx = Standard keyboard/WPS keyboard/UNIX keyboard
Thick/thin = 802.3/Ethernet thick wire/ThinWire
Thick/twisted = 802.3/Ethernet thick wire/twisted-pair (10BaseT)
U.S./U.K./Canada are 120-V devices

VXT 2000 with 15-inch Monitor

	VR315 Monochrome Monitor			VR326 Color Monitor	
Country/Language	Thick/Thin (Two Box)	Thick/Twisted (Two Box)	Thick/Twisted (Single Box)	Thick/Thin (Two Box)	Thick/Twisted (Two Box)
U.S., U.K./English	VX215-AA/BA/CA	VX215-JA/KA/LA	VX225-JA/KA/LA	VX215-DA/EA/FA	VX215-MA/NA/PA
Canada/French	VX215-AC/BC/CC	VX215-JC/KC/LC	VX225-JC/KC/LC	VX215-DC/EC/FC	VX215-MC/NC/PC
Belgium/Flemish	VX215-AB/BB/CB	VX215-JB/KB/LB	VX225-JB/KB/LB	VX215-DD/EB/FB	VX215-MB/NB/PB
Denmark/Danish	VX215-AD/BD/CD	VX215-JD/KD/LD	VX225-JD/KD/LD	VX215-DD/ED/FD	VX215-MD/ND/PD
U.K./English	VX215-AE/BE/CE	VX215-JE/KE/LE	VX225-JE/KE/LE	VX215-DE/EE/FE	VX215-ME/NE/PE
Finland/Finnish	VX215-AF/BF/CF	VX215-JF/KF/LF	VX225-JF/KF/LF	VX215-DF/EF/FF	VX215-MF/NF/PF
Germany/German	VX215-AG/BG/CG	VX215-JG/KG/LG	VX225-JG/KG/LG	VX215-DG/EG/FG	VX215-MG/NG/PG
Holland/Dutch	VX215-AH/BH/CH	VX215-JH/KH/LH	VX225-JH/KH/LH	VX215-DH/EH/FH	VX215-MH/NH/PH
Italy/Italian	VX215-AI/BI/CI	VX215-JI/KI/LI	VX225-JI/KI/LI	VX215-DI/EI/FI	VX215-MI/NI/PI
Switzerland/French	VX215-AK/BK/CK	VX215-JK/KK/LK	VX225-JK/KK/LK	VX215-DK/EK/FK	VX215-MK/NK/PK
Switzerland/German	VX215-AL/BL/CL	VX215-JL/KL/LL	VX225-JL/KL/LL	VX215-DL/EL/FL	VX215-ML/NL/PL
Sweden/Swedish	VX215-AM/BM/CM	VX215-JM/KM/LM	VX225-JM/KM/LM	VX215-DM/EM/FM	VX215-MM/NM/PM
Norway/Norwegian	VX215-AN/BN/CN	VX215-JN/KN/LN	VX225-JN/KN/LN	VX215-DN/EN/FN	VX215-MN/NN/PN
France/French	VX215-AP/BP/CP	VX215-JP/KP/LP	VX225-JP/KP/LP	VX215-DP/EP/FP	VX215-MP/NP/PP
Spain/Spanish	VX215-AS/BS/CS	VX215-JS/KS/LS	VX225-JS/KS/LS	VX215-DS/ES/FS	VX215-MS/NS/PS
Portugal/Portuguese	VX215-AV/CV	VX215-JV/LV	VX225-JV/LV	VX215-DV/FV	VX215-MV/PV
Australia, New Zealand/English	VX215-AZ/BZ/CZ	VX215-JZ/KZ/LZ	VX225-JZ/KZ/LZ	VX215-DZ/EZ/FZ	VX215-MZ/NZ/PZ

VXT 2000 with 17-inch Monitor

	VRM17 Monochrome Monitor		VRC16 Color Monitor		VRM17 Grayscale Monitor	
Country/Language	Thick/Thin	Thick/Twisted	Thick/Thin	Thick/Twisted	Thick/Thin	Thick/Twisted
U.S.,U.K./English	VX217-AA/BA/CA	VX217-JA/KA/LA	VX217-MA/NA/PA	VX217-DA/EA/FA	VX217-GA/HA/IA	VX217-RA/SA/TA
Canada/French	VX217-AC/BC/CC	VX217-JC/KC/LC	VX217-MB/NB/PB	VX217-DC/EC/FC	VX217-GC/HC/IC	VX217-RC/SC/TC
Belgium/Flemish	VX217-AB/BB/CB	VX217-JB/KB/LB	VX217-MC/NC/PC	VX217-DB/EB/FB	VX217-GB/HB/IB	VX217-RB/SB/TB
Denmark/Danish	VX217-AD/BD/CD	VX217-JD/KD/LD	VX217-MD/ND/PD	VX217-DD/ED/FD	VX217-GD/HD/ID	VX217-RD/SD/TD
U.K./English	VX217-AE/BE/CE	VX217-JE/KE/LE	VX217-ME/NE/PE	VX217-DE/EE/FE	VX217-GE/HE/IE	VX217-RE/SE/TE
Finland/Finnish	VX217-AF/BF/CF	VX217-JF/KF/LF	VX217-MF/NF/PF	VX217-DF/EF/FF	VX217-GF/HF/IF	VX217-RF/SF/TF
Germany/German	VX217-AG/BG/CG	VX217-JG/KG/LG	VX217-MG/NG/PG	VX217-DG/EG/FG	VX217-GG/HG/IG	VX217-RG/SG/TG
Holland/Dutch	VX217-AH/BH/CH	VX217-JH/KH/LH	VX217-MH/NH/PH	VX217-DH/EH/FH	VX217-GH/HH/IH	VX217-RH/SH/TH
Italy/Italian	VX217-AI/BI/CI	VX217-JI/KI/LI	VX217-MI/NI/PI	VX217-DI/EI/FI	VX217-GI/HI/II	VX217-RI/SI/TI
Switzerland/French	VX217-AK/BK/CK	VX217-JK/KK/LK	VX217-MK/NK/PK	VX217-DK/EK/FK	VX217-GK/HK/IK	VX217-RK/SK/TK
Switzerland/German	VX217-AL/BL/CL	VX217-JL/KL/LL	VX217-ML/NL/PL	VX217-DL/EL/FL	VX217-GL/HL/IL	VX217-RL/SL/TL
Sweden/Swedish	VX217-AM/BM/CM	VX217-JM/KM/LM	VX217-MM/NM/PM	VX217-DM/EM/FM	VX217-GM/HM/IM	VX217-RM/SM/TM
Norway/Norwegian	VX217-AN/BN/CN	VX217-JN/KN/LN	VX217-MN/NN/PN	VX217-DN/EN/FN	VX217-GN/HN/IN	VX217-RN/SN/TN
France/French	VX217-AP/BP/CP	VX217-JP/KP/LP	VX217-MP/NP/PP	VX217-DP/EP/FP	VX217-GP/HP/IP	VX217-RP/SP/TP
Spain/Spanish	VX217-AS/BS/CS	VX217-JS/KS/LS	VX217-MS/NS/PS	VX217-DS/ES/FS	VX217-GS/HS/IS	VX217-RS/SS/TS
Portugal/Portuguese	VX217-AV/CV	VX217-JV/LV	VX217-MV/PV	VX217-DV/FV	VX217-GV/IV	VX217-RV/TV
Australia, New Zealand/English	VX217-AZ/BZ/CZ	VX217-JZ/KZ/LZ	VX217-MZ/NZ/PZ	VX217-DZ/EZ/FZ	VX217-GZ/HZ/IZ	VX217-RZ/SZ/TZ

Step 1—Select Terminal *(Continued)*

Notes: VX219-xx/xx/xx = Standard keyboard/WPS keyboard/UNIX keyboard
Thick/thin = 802.3/Ethernet thick wire/ThinWire
Thick/twisted = 802.3/Ethernet thick wire/twisted-pair (10BaseT)
U.S./U.K./Canada are 120-V devices

VXT 2000 with 19-inch Monitor

	VR319 Monochrome Monitor		VR320 Color Monitor		VR319 Grayscale Monitor	
Country/Language	**Thick/Thin**	**Thick/Twisted**	**Thick/Thin**	**Thick/Twisted**	**Thick/Thin**	**Thick/Twisted**
U.S., U.K./English	VX219-AA/BA/CA	VX219-JA/KA/LA	VX219-DA/EA/FA	VX219-MA/NA/PA	VX219-GA/HA/IA	VX219-RA/SA/TA
Canada/French	VX219-AC/BC/CC	VX219-JC/KC/LC	VX219-DC/EC/FC	VX219-MC/NC/PC	VX219-GC/HC/IC	VX219-RC/SC/TC
Belgium/Flemish	VX219-AB/BB/CB	VX219-JB/KB/LB	VX219-DB/EB/FB	VX219-MB/NB/PB	VX219-GB/HB/IB	VX219-RB/SB/TB
Denmark/Danish	VX219-AD/BD/CD	VX219-JD/KD/LD	VX219-DD/ED/FD	VX219-MD/ND/PD	VX219-GD/HD/ID	VX219-RD/SD/TD
U.K./English	VX219-AE/BE/CE	VX219-JE/KD/LE	VX219-DE/EE/FE	VX219-ME/NE/PE	VX219-GE/HE/IE	VX219-RE/SE/TE
Finland/Finnish	VX219-AF/BF/CF	VX219-JF/KF/LF	VX219-DF/EF/FF	VX219-MF/NF/PF	VX219-GF/HF/IF	VX219-RF/SF/TF
Germany/German	VX219-AG/BG/CG	VX219-JG/KG/LG	VX219-DG/EG/FG	VX219-MG/NG/PG	VX219-GG/HG/IG	VX219-RG/SG/TG
Holland/Dutch	VX219-AH/BH/CH	VX219-JH/KH/LH	VX219-DH/EH/FH	VX219-MH/NH/PH	VX219-GH/HH/IH	VX219-RH/SH/TH
Italy/Italian	VX219-AI/BI/CI	VX219-JI/KI/LI	VX219-DI/EI/FI	VX219-MI/NI/PI	VX219-GI/HI/II	VX219-RI/SI/TI
Switzerland/French	VX219-AK/BK/CK	VX219-JK/KK/LK	VX219-DK/EK/FK	VX219-MK/NK/PK	VX219-GK/HK/IK	VX219-RK/SK/TK
Switzerland/German	VX219-AL/BL/CL	VX219-JL/KL/LL	VX219-DL/EL/FL	VX219-ML/NL/PL	VX219-GL/HL/IL	VX219-RL/SL/TL
Sweden/Swedish	VX219-AM/BM/CM	VX219-JM/KM/LM	VX219-DM/EM/FM	VX219-MM/NM/PM	VX219-GM/HM/IM	VX219-RM/SM/TM
Norway/Norwegian	VX219-AN/BN/CN	VX219-JN/KN/LN	VX219-DN/EN/FN	VX219-MN/NN/PN	VX219-GN/HN/IN	VX219-RN/SN/TN
France/French	VX219-AP/BP/CP	VX219-JP/KP/LP	VX219-DP/EP/FP	VX219-MP/NP/PP	VX219-GP/HP/IP	VX219-RP/SP/TP
Spain/Spanish	VX219-AS/BS/CS	VX219-JS/KS/LS	VX219-DS/ES/FS	VX219-MS/NS/PS	VX219-GS/HS/IS	VX219-RS/SS/TS
Portugal/Portuguese	VX219-AV/CV	VX219-JV/LV	VX219-DV/FV	VX219-MV/PV	VX219-GV/IV	VX219-RV/TV
Australia, New Zealand/English	VX219-AZ/BZ/CZ	VX219-JZ/KZ/LZ	VX219-DZ/EZ/FZ	VX219-MZ/NZ/PZ	VX219-GZ/HZ/IZ	VX219-RZ/SZ/TZ

Step 2—Software License

One software license per VXT 2000 is required.

QL-XNGA9-AA VXT 2000 software license

Step 3—Media and Documentation/InfoServer 150VXT

Select a Host media and documentation kit, OR Server media and documentation kit (for existing InfoServer 100/150), OR preconfigured InfoServer 150VXT.

Step 3a—Host and Server Media and Documentation

QA-XNGAB-Hx For Host VMS systems
QA-XNGAC-Hx For Host ULTRIX systems
QA-XNGAD-HM For Host UNIX systems
QA-XNGAD-HM For Host UNIX systems—QIC media
QA-XNGAE-HP For Host UNIX systems—DAT media

QA-XNGAF-Hx For Server VMS systems
QA-XNGAG-Hx For Server ULTRIX systems
QA-XNGAH-HM For Server UNIX systems
QA-XNGAH-HP For Server UNIX systems—QIC media
QA-XNGAJ-HP For Server UNIX systems—DAT media

Note: x denotes media type: M = magtape; 5 = TK50

Step 3b—Server Media and Documentation

InfoServer 100 and InfoServer 150 can be upgraded to support up to eight VXT 2000 terminals.

InfoServer 100 requires the following license and media and documentation kit and appropriate InfoServer media and documentation kit (QA-XNGAx-xx):

QL-YSH99-RA	InfoServer 100 upgrade license (V1.0 to V2.0)
QA-YSHAA-H8	InfoServer 100 media and documentation V2.0

VXT 2000 media and documentation for InfoServer 100 or InfoServer 150.
Note: Select media and documentation based on primary host system.

QA-XNGAF-Hx	For VMS systems
QA-XNGAG-Hx	For ULTRIX systems
QA-XNGAH-Hx	For UNIX systems
QA-XNGAH-HP	For UNIX systems—QIC media
QA-XNGAJ-HP	For UNIX systems—DAT media

Note: x denotes media type: M = magtape; 5 = TK50

Step 3—InfoServer 150VXT

InfoServer 150VXT is preconfigured with VXT server software and acts as a load device and storage device.

SEACV-AA/A9	InfoServer 150VXT with one RRD42 CD-ROM; 120 V/240 V
SEACW-AA/A9	InfoServer 150VXT with two RRD42 CD-ROMs; 120 V/240 V

Step 4—802.3/Ethernet cables

Order one 802.3/Ethernet cable per VXT 2000.

BNE4C-xx	Thick wire 802.3/Ethernet cable (xx = 02/05 refers to length in meters)
BNE3H-xx	Thick wire transceiver cable with straight connector—PVC (xx = 05/10/20/40 refers to length in meters)
BNE3L-xx	Thick wire transceiver cable with straight connector—Teflon (xx = 05/10/20/40 refers to length in meters)
BC16M-xx	ThinWire 802.3/Ethernet cable (xx = 06/15/30 refers to length in feet)

Step 5—Memory

Three additional memory slots are available. VXT 2000 terminals can be expanded to 16 Mbytes of memory. (Four Mbytes included with each terminal—to reach the maximum of 16 Mbytes, the three available slots must use 4-Mbyte SIMM modules.) Memory options can be used in any combination.

Note: VXT 2000s using host media require 10 Mbytes of memory.

MS200-AA	2 Mbytes of SIMM memory
MS200-BA	4 Mbytes of SIMM memory

Step 6—DECimage Option

The DECimage option is a customer-installable hardware option and can be used with all VXT 2000 terminals except the single-box model.

VX20A-OP	DECimage option
QL-GL9A9-AA	DECIUL/VMS V1.0 VAX-based system license
QA-GL9AA-Hx	DECIUL/VMS kit
QL-GL9AA-GZ	DECIUL/VMS documentation
QL-GM1A9-AA	DECIUL/ULTRIX V1.0 VAX-based system license
QA-GM1AA-Hx	DECIUL/ULTRIX kit (VAX)
QA-GM1AA-GZ	DECIUL/ULTRIX documentation (VAX)
QL-GN1A8-AA	DECIUL/ULTRIX V1.0 RISC-based system license
QA-GN1AA-Hx	DECIUL/ULTRIX kit (RISC)
QA-GN1AA-GZ	DECIUL/ULTRIX documentation (RISC)

Note: x denotes media type: M = magtape; 5 = TK50

Specifications

Physical Characteristics

System Box*

Height	6.1 cm (2.4 in.)
Width	39.1 cm (15.4 in.)
Depth	36.8 cm (14.5 in.)
Weight	4.6 kg (10.15 lb)

Monitors (Monochrome)

	15-inch (VR315)	15-inch single-box (VR325)	17-inch (VRM17)	19-inch (VR319)
Height	38.2 cm (15.0 in.)	36.9 cm (14.5 in.)	41.9 cm (16.5 in.)	46.0 cm (18.0 in.)
Width	38.2 cm (15.0 in.)	36.2 cm (14.75 in.)	40.6 cm (16.0 in.)	49.5 cm (19.5 in.)
Depth	39.6 cm (15.6 in.)	38.2 cm (15 in.)	37.6 cm (14.8 in.)	40.1 cm (15.8 in.)
Weight	14.4 kg (32.0 lb)	14.6 kg (32 lb)	16.8 kg (37.0 lb)	21.8 kg (48.0 lb)

Monitors (Color)

	15-inch (VR326)	17-inch (VRC16)	19-inch (VR320)
Height	38.2 cm (15.0 in.)	43.3 cm (17 in.)	46.0 cm (18.0 in.)
Width	38.2 cm (15.0 in.)	41.3 cm (16.2 in.)	49.5 cm (19.5 in.)
Depth	39.6 cm (15.6 in.)	43.6 cm (17.1 in.)	45.2 cm (17.8 in.)
Weight	17.2 kg (38.0 lb)	25 kg (55 lb)	29.0 kg (64.0 lb)

Dots-per-inch (dpi)	100
Orientation	Landscape (horizontal)
Resolution	1,280 × 1,024 (VR315, VRM17, VR319, VR320) 1,024 × 768 (VR325, VR326, VRC16)
Refresh rate	72 Hz
Video attributes	Reverse video, underline, bold, and blinking (can be selected individually or in any combination); 2-plane monochrome or 8-plane color/grayscale capability

Power Requirements

Line voltage	120 V/240 V
Voltage tolerance	88 to 132 Vrms/176 to 264 Vrms
Line frequency	50 to 60 Hz

Operating Environment

Temperature	10° to 40° C (50° to 104° F)
Relative humidity	10% to 90% noncondensing
Max. operating altitude	2.4 km (8000 ft)

Input Devices

Keyboards	Digital standard (LK401); WPS (LK402—Gold Key); UNIX (LK421)
Mouse	Three-button mouse, 200 pulses per linear inch

Operating System/Communication Environments

Operation	Operating System	Communication Protocol
Terminal Session	VMS V4.6	LAT, TELNET (requires UCX)
	UNIX (any BSD V2.0 or higher)	TCP/IP, TELNET
	ULTRIX (any version)	TCP/IP, TELNET
	UWS V4.0	LAT, TELNET
X Window Session	VMS V5.4-2	LAT†, TCP/IP
	UNIX (any version)	TCP/IP
	UWS V4.0 or higher	TCP/IP

* Applicable to two-box VXT 2000 models only.

† LAT master is recommended to achieve improved boot and network performance. LAT master is available as an optional saveset in VMS V5.4-1 through V5.4-3 and can be installed by the system manager. LAT master is integrated in VMS V5.5.

Video Terminals Comparison Chart

Features	VT420 (North American Model)	VT420 (International Model)	VT420 (International LMF)	VT420 with PCTerm	VT340+
Common Attributes					
VT220 compatibility (text)	X	X	X	X	X
Bidirectional printer port	X	X	X	X	X
Two-piece, convection-cooled design	X	X	X	X	X
25th status line	X	X	X	X	X
Keyboard status line	X	X	X	X	X
Digital LK201 keyboard					
Digital LK401 keyboard	X	X	X		X
Digital LK443/LK444 keyboard				X	
Programmable function keys (15)	X	X	X		X
Programmable function keys (48)				X	
Modem support	X	X	X	X	X
DEC-423 interface port (EIA)	X	X	X	X	X
Second DEC-423 interface port for dual sessions or printer port	X	X	X	X	X
Pedestal base with tilt and swivel	X	X	X	X	X
Extended Performance Attributes					
Programmable function keys saved in ROM					X
14-inch flat monochrome CRT screen	X	X	X	X	
Paper-white, amber, or green display	X	X			
Paper-white phosphor only			X	X	
13-inch color CRT screen					X
National replacement character set		X	X	X	X
EIA-232 port		X	X	X	X
Full EIA-232 modem control		X	X	X	X
10-foot cable (BC16E) and 25-pin EIA-232 adapter (H8571-F)	X				
Dual sessions (single or dual wire)	X	X	X	X	X
Vertical split screen					X
Horizontal split screen	X	X	X	X	X
Multiple pages of memory	X	X	X	X	X
Window management features	X	X	X	X	
Downline-loadable macros	X	X	X	X	
Block-mode operation					X
120-V capability only	X	X	X		X
120-V or 240-V versions	X	X	X		X
120-V–240-V self-adjusting capability		X	X	X	
Graphics Attributes					
VT330 compatibility (text and graphics)					X
VT340 compatibility (color text and graphics)					X
Graphics memory, two screens					X
Mouse/tablet interface					X
16 colors, 16 shades of gray, 13-inch screen					X
Certifications					
FCC Class A Certification	X				X
FCC Class B Certification		X	X	X	
VDE Class B, GS Certification		X	X	X	
Swedish Radioprotection Institute (SSI) conformance on low-frequency magnetic fields and low electrostatic fields; white phosphor only			X	X	

VT420 Text Terminal



The VT420 is a low-cost, dual-session text terminal with award-winning functionality and ergonomic design.

The VT420 terminal improves the standards set by the VT320 terminal by providing many enhancements, including a three-year warranty. Performance, ergonomics, and display features of the VT420 terminal improve application interaction, screen management, viewing comfort, and productivity. Fully formed fonts, higher resolution, overscan, and up to 48 displayable data lines allow text applications to be displayed with clarity and greater functionality comparable to more expensive desktop display devices.

Display characteristics, combined with commands for management of text windows, off-screen memory, and locally stored macros, can enhance the performance of interactive text applications such as online transaction processing, spreadsheets, database inquiries, and word processing.

Digital terminal servers or Session Support Utility software (a VMS layered product) enable two simultaneous sessions to run through a single wire from the same or different hosts on the network. This saves the cost of installing a second wire and the cost of a second port. Two-wire dual sessions are also supported through the independent host communications ports. The user decides how to allocate the communication ports; one can be used for a printer, or both can be used for host communications.

In dual sessions, information can be viewed from each session simultaneously or one at a time with the "flip-screen" function. A total of 48 data lines plus two status lines can be displayed and the number of lines shown in each session on the screen can be adjusted.

Whether the terminal is in single-session or dual-session mode, information can be copied and pasted within and between sessions. Copy and paste are local functions and can be used with existing applications. The paste function sends the copied data to the receiving application as if it had been entered from the keyboard.

The VT420 terminal is fully supported by a complete range of operating systems and applications from Digital and other vendors. Any software that currently supports text-only terminals in the VT100/200/300 families, or the VT52 terminal, will support the VT420. VT420 terminals can be used with VMS V5.3, as well as earlier releases of VMS if they are set up with other VT terminal identification.

The VT420 terminal is available in three models: the North American, the international, and the international Low Magnetic Field (LMF). The North American version with an MMJ modular connector is suitable for most North American requirements where full modem control is not required. The international version includes an EIA-232 25-pin communications port and FCC Class B certification. The Low Magnetic Field version includes conformance to the Swedish Radioprotection Institute (SSI) requirement on low-frequency magnetic fields and low electrostatic fields, in addition to the standard features of the International model. See the **Video Terminals Comparison Chart** on page 8.9 for more details.

Features

- 14-inch flat-faced, anti-glare CRT screen, available in paper-white, amber, or green phosphors.
- 800 by 414 pixel resolution, 70-Hz refresh rate, and overscan.
- Displays 24, 25, 36, or 48 data lines per session in 80 or 132 columns and six different font sizes per session.

- Dual-sessions capability with choice of viewing each session independently in flip-screen mode or both simultaneously in split-screen mode.
- Two on-screen status lines (one per session) plus a keyboard/session indicator line.
- Local copy and paste within or between sessions.
- Low-profile, narrow LK401 keyboard designed for user comfort and improved productivity provides two operating modes: a "novice" mode which is similar to the LK201, and a new "extended" mode that activates extended reports, a key position mode for alternate layouts, and the ability to take advantage of the new "ALT" keys functions.
- Six pages of memory.
- Text windowing features and local macros enable efficient implementation of forms management, pop-up menus, help, and dialog boxes for improved user interfaces.
- Downloadable macro feature enables frequently used strings of text and control sequences to be stored and executed from a 12-Kbyte memory buffer (6 Kbytes per session). Up to 64 macros can be stored, with a nesting of 16 levels to permit fast screen updates and reduced network traffic.
- Includes function keys "hold," "set-up," "print," and "switch session," as well as keys for copy/paste and paging. Applications can clear volatile memory, reset settings, access the terminal's unique serial number, and be informed if the operator attempts to enter dual sessions, or reset or repower the terminal.

Ordering Information

For quantity orders (50 or more), or when ordering any VT420 terminal with a system or upgrade, use the DL prefix. For quantities of 1–49, use the order numbers listed, without a prefix.

The VT420 North American models include: monitor, keyboard (WPS or standard), attached power cord, legend strip, BC16E-10 communications cable and H8571-F adapter, and documentation.

The VT420 International and International LMF models include: monitor, keyboard (WPS or standard), detached power cord, legend strip, and documentation. (*Does not include* BC16E-10 communications cable and H8571-F adapter.)

	Model Number	Description	Model Number	Description
U.S. North American	**VT420-AA**	White, text terminal, standard keyboard, 120 V	**VT420-DA**	White, text terminal, WPS keyboard, 120 V
	VT420-BA	Green, text terminal, standard keyboard, 120 V	**VT420-EA**	Green, text terminal, WPS keyboard, 120 V
	VT420-CA	Amber, text terminal, standard keyboard, 120 V	**VT420-FA**	Amber, text terminal, WPS keyboard, 120 V
U.S. International	**VT420-GA**	White, text terminal, standard keyboard, 120–240 V	**VT420-KA**	White, text terminal, WPS keyboard, 120–240 V
	VT420-HA	Green, text terminal, standard keyboard, 120–240 V	**VT420-LA**	Green, text terminal, WPS keyboard, 120–240 V
	VT420-JA	Amber, text terminal, standard keyboard, 120–240 V	**VT420-MA**	Amber, text terminal, WPS keyboard, 120–240 V
U.S. Low Magnetic Field	**VT420-SA**	White, text terminal, standard keyboard, 120–240 V	**VT420-TA**	White, text terminal, WPS keyboard, 120–240 V
Belgium (Flemish)	**VT420-AB**	White, text terminal, standard keyboard, 120–240 V	**VT420-DB**	White, text terminal, WPS keyboard, 120–240 V
	VT420-BB	Green, text terminal, standard keyboard, 120–240 V	**VT420-EB**	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CB	Amber, text terminal, standard keyboard, 120–240 V	**VT420-FB**	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SB**	White, text terminal, standard keyboard, 120–240 V	**VT420-TB**	White, text terminal, WPS keyboard, 120–240 V
Canada (French)	**VT420-AC**	White, text terminal, standard keyboard, 120–240 V	**VT420-DC**	White, text terminal, WPS keyboard, 120–240 V
	VT420-BC	Green, text terminal, standard keyboard, 120–240 V	**VT420-EC**	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CC	Amber, text terminal, standard keyboard, 120–240 V	**VT420-FC**	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SC**	White, text terminal, standard keyboard, 120–240 V	**VT420-TC**	White, text terminal, WPS keyboard, 120–240 V
Denmark	**VT420-AD**	White, text terminal, standard keyboard, 120–240 V	**VT420-DD**	White, text terminal, WPS keyboard, 120–240 V
	VT420-BD	Green, text terminal, standard keyboard, 120–240 V	**VT420-ED**	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CD	Amber, text terminal, standard keyboard, 120–240 V	**VT420-FD**	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SD**	White, text terminal, standard keyboard, 120–240 V	**VT420-TD**	White, text terminal, WPS keyboard, 120–240 V
U.K./Ireland	**VT420-AE**	White, text terminal, standard keyboard, 120–240 V	**VT420-DE**	White, text terminal, WPS keyboard, 120–240 V
	VT420-BE	Green, text terminal, standard keyboard, 120–240 V	**VT420-EE**	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CE	Amber, text terminal, standard keyboard, 120–240 V	**VT420-FE**	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	**VT420-SE**	White, text terminal, standard keyboard, 120–240 V	**VT420-TE**	White, text terminal, WPS keyboard, 120–240 V

Ordering Information *(Continued)*

	Model Number	Description	Model Number	Description
Finland	VT420-AF	White, text terminal, standard keyboard, 120–240 V	VT420-DF	White, text terminal, WPS keyboard, 120–240 V
	VT420-BF	Green, text terminal, standard keyboard, 120–240 V	VT420-EF	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CF	Amber, text terminal, standard keyboard, 120–240 V	VT420-FF	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	VT420-SF	White, text terminal, standard keyboard, 120–240 V	VT420-TF	White, text terminal, WPS keyboard, 120–240 V
Germany/Austria	VT420-AG	White, text terminal, standard keyboard, 120–240 V	VT420-DG	White, text terminal, WPS keyboard, 120–240 V
	VT420-BG	Green, text terminal, standard keyboard, 120–240 V	VT420-EG	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CG	Amber, text terminal, standard keyboard, 120–240 V	VT420-FG	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	VT420-SG	White, text terminal, standard keyboard, 120–240 V	VT420-TG	White, text terminal, WPS keyboard, 120–240 V
Netherlands	VT420-AH	White, text terminal, standard keyboard, 120–240 V	VT420-DH	White, text terminal, WPS keyboard, 120–240 V
	VT420-BH	Green, text terminal, standard keyboard, 120–240 V	VT420-EH	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CH	Amber, text terminal, standard keyboard, 120–240 V	VT420-FH	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	VT420-SH	White, text terminal, standard keyboard, 120–240 V	VT420-TH	White, text terminal, WPS keyboard, 120–240 V
Italy	VT420-AI	White, text terminal, standard keyboard, 120–240 V	VT420-DI	White, text terminal, WPS keyboard, 120–240 V
	VT420-BI	Green, text terminal, standard keyboard, 120–240 V	VT420-EI	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CI	Amber, text terminal, standard keyboard, 120–240 V	VT420-FI	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	VT420-SI	White, text terminal, standard keyboard, 120–240 V	VT420-TI	White, text terminal, WPS keyboard, 120–240 V
Switzerland (French)	VT420-AK	White, text terminal, standard keyboard, 120–240 V	VT420-DK	White, text terminal, WPS keyboard, 120–240 V
	VT420-BK	Green, text terminal, standard keyboard, 120–240 V	VT420-EK	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CK	Amber, text terminal, standard keyboard, 120–240 V	VT420-FK	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	VT420-SK	White, text terminal, standard keyboard, 120–240 V	VT420-TK	White, text terminal, WPS keyboard, 120–240 V
Switzerland (German)	VT420-AL	White, text terminal, standard keyboard, 120–240 V	VT420-DL	White, text terminal, WPS keyboard, 120–240 V
	VT420-BL	Green, text terminal, standard keyboard, 120–240 V	VT420-EL	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CL	Amber, text terminal, standard keyboard, 120–240 V	VT420-FL	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	VT420-SL	White, text terminal, standard keyboard, 120–240 V	VT420-TL	White, text terminal, WPS keyboard, 120–240 V
Sweden	VT420-AM	White, text terminal, standard keyboard, 120–240 V	VT420-DM	White, text terminal, WPS keyboard, 120–240 V
Norway	VT420-AN	White, text terminal, standard keyboard, 120–240 V	VT420-DN	White, text terminal, WPS keyboard, 120–240 V
	VT420-BN	Green, text terminal, standard keyboard, 120–240 V	VT420-EN	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CN	Amber, text terminal, standard keyboard, 120–240 V	VT420-FN	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	VT420-SN	White, text terminal, standard keyboard, 120–240 V	VT420-TN	White, text terminal, WPS keyboard, 120–240 V
France	VT420-AP	White, text terminal, standard keyboard, 120–240 V	VT420-DP	White, text terminal, WPS keyboard, 120–240 V
	VT420-BP	Green, text terminal, standard keyboard, 120–240 V	VT420-EP	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CP	Amber, text terminal, standard keyboard, 120–240 V	VT420-FP	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	VT420-SP	White, text terminal, standard keyboard, 120–240 V	VT420-TP	White, text terminal, WPS keyboard, 120–240 V
South America/ Mexico	VT420-AR	White, text terminal, standard keyboard, 120–240 V	VT420-DR	White, text terminal, WPS keyboard, 120–240 V
	VT420-BR	Green, text terminal, standard keyboard, 120–240 V	VT420-ER	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CR	Amber, text terminal, standard keyboard, 120–240 V	VT420-FR	Amber, text terminal, WPS keyboard, 120–240 V
Spain	VT420-AS	White, text terminal, standard keyboard, 120–240 V	VT420-DS	White, text terminal, WPS keyboard, 120–240 V
	VT420-BS	Green, text terminal, standard keyboard, 120–240 V	VT420-ES	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CS	Amber, text terminal, standard keyboard, 120–240 V	VT420-FS	Amber, text terminal, WPS keyboard, 120–240 V
Low Magnetic Field	VT420-SS	White, text terminal, standard keyboard, 120–240 V	VT420-TS	White, text terminal, WPS keyboard, 120–240 V
Israel	VT420-AT	White, text terminal, standard keyboard, 120–240 V	VT420-CT	Amber, text terminal, standard keyboard, 120–240 V
	VT420-BT	Green, text terminal, standard keyboard, 120–240 V		
Portugal	VT420-AV	White, text terminal, standard keyboard, 120–240 V	VT420-CV	Amber, text terminal, standard keyboard, 120–240 V
	VT420-BV	Green, text terminal, standard keyboard, 120–240 V		
Australia/ New Zealand	VT420-AZ	White, text terminal, standard keyboard, 120–240 V	VT420-DZ	White, text terminal, WPS keyboard, 120–240 V
	VT420-BZ	Green, text terminal, standard keyboard, 120–240 V	VT420-EZ	Green, text terminal, WPS keyboard, 120–240 V
	VT420-CZ	Amber, text terminal, standard keyboard, 120–240 V	VT420-FZ	Amber, text terminal, WPS keyboard, 120–240 V

Accessories and Supplies

For more information, refer to the *DECdirect* catalog.

EK-VT420-RM	*VT420 Programmer's Reference Guide*
H8673-AA	20 mA active host Mate-N-Lok to EIA-423 DECconnect MMJ passive converter
H8673-AB	20 mA active host RJ11 (6 pin) to EIA-423 DECconnect MMJ passive converter
VSXXX-HA	DECwand bar code reader, 6-mil aperture, visible red light
VSXXX-HB	DECwand bar code reader, 8-mil aperture, visible red light
VT4XX-GF	VT420 screen filter with static protection (qty. 1)
VT4XX-XG	VT420 screen filter with static protection (qty. 5)
VT4XX-XF	VT420 screen filter with static protection (qty. 75)
VT3XX-SC	Video screen cleaner
VT4XX-GF	VT420 anti-glare screen
LK4XX-KC	Clear, blank, full keyboard overlay (10/box)
LK4XX-KD	Clear, blank, numeric keypad overlay (15/box)
LK4XX-KH	KED/EDT numeric keypad overlay (10/box)
LK4XX-KJ	Blank keycap set (108/set)

VT420 Text Terminal

Specifications

Physical Characteristics

	VT420 Terminal	LK401 Keyboard
Height	31.2 cm (12.3 in.)	4.5 cm (1.75 in.)
Width	31.5 cm (12.4 in.)	47.8 cm (18.8 in.)
Depth	33.0 cm (13.0 in.)	17.8 cm (7.0 in.)
Weight	8.5 kg (18.7 lb)	1.4 kg (3.0 lb)

Dual-Session Modes: Single or dual, independent set-up characteristics

Screen Characteristics

Type	14-inch flat-surfaced, anti-glare CRT, overscan					
Refresh rates	70 Hz, 60 Hz (selectable)					
Phosphors	Paper white (P192), amber (P194), or green (P31) Low Magnetic Field model—paper white only					
Resolution	800 pixels × 414 scan lines					
Display format	Full screen of 24, 36, or 48 data lines, terminal indicator line, optional status line each session. Other formats of 25, 40, and 50 data lines depend on font size, page size, and status line display selections.					
Column/rows:	**80×24**	**132×24**	**80×36**	**132×36**	**80×48**	**132×48**
Cell size	10×16	6×16	10×10	6×10	10×8	6×8
Character size	8×10	5×9	8×7	5×7	8×6	5×7
Status lines	1 per session, set-up selectable					
Cursor selection	On/off, block/underline, blink/steady					
Attributes	Normal, reverse, underline, bold, blink, double width, double height, double height/width					
Scrolling: Types	Vertical and horizontal on full display or within defined rectangular region					
Rates	Jump, scroll 2 (9 lines per second), scroll 4 (18 lines per second)					

Keyboard (LK401)

108 keys, tactile feel, full matte finish, sculptured key caps, volume selections for keyclick, margin bell, and warning bell	
Modes	Novice and extended
Character location selections	Set-up choices for: greater than/less than (><), shift comma and period (, and .), tilde/single quote (~'), and escape (ESC)
Copy/paste	Up to a full screen of 24 lines by 132 columns can be copied within or between sessions
Function keys	15 shiftable to 30, 15 host programmable, 256 bytes per session

Local Memory: Single-Session Mode

Page configuration	6 pages of 24 lines; 5 pages of 25 lines; 4 pages of 36 lines; 3 pages of 48 lines; 2 pages of 72 lines; 1 page of 144 lines
Macro buffer	6,000 bytes

Specifications *(Continued)*

Local Memory: Dual-Session Mode (per session)

Page configuration	3 pages of 24 lines; 2 pages of 25 lines; 2 pages of 36 lines; 1 page of 48 lines; 1 page of 72 lines
Macro buffer	6,000 bytes per session
Addressable by	Page(s), rectangle(s), line(s), character(s)
Rectangular operations	Copy, fill, erase, change attributes, insert/delete columns

Character Sets: ASCII, DEC supplemental, DEC special graphics, ISO Latin-1, DEC technical, 7-bit NRCS*

* International and Low Magnetic Field models only

Communications

Full-duplex asynchronous with selectable local echo full modem control.* 7-bit or 8-bit character length, 1 or 2 stop bits

Speeds	300, 600, 1200, 2400, 4800, 9600, 19,200, and 38,400 baud (set-up selectable). Transmit and receive rates can be set separately.
Parity	Even, odd, none, even no-check (7- or 8-bit); mark, space (7-bit only), set-up selectable. Transmit and receive must be the same.
Interface	North American: 2 DEC-423 (MMJ) (1 as alternate printer port), 10-foot (3-meter) 25-pin adapter cable included; International and Low Magnetic Field: 1 DEC-423 (MMJ), 1 EIA-232 (25-pin), and 1 printer port (MMJ)

Printer Port: Full bidirectional communications; assignable to either session or shared between sessions; supports Digital desktop printers. May alternately be configured as second DEC-423 port for 2-wire dual session.

Power Cord/Power Supply: North American—attached, 120 V; International and Low Magnetic Field—detached, auto range 120–240 V

Standards: North American—FCC Class A certification, UL, CSA, IEC; International—FCC Class B, GS certification, UL, CSA, IEC, VDE-B; Low Magnetic Field—Swedish Radioprotection Institute (SSI) conformance on low-frequency magnetic fields and low electrostatic fields, FCC Class B, GS certification, UL, CSA, IEC, VDE-B

Environment

	Operating	Storage
Temperature	10° to 40° C (50° to 104° F)	–40° to 66° C (–40° to 151° F)
Relative humidity	10% – 90%	50% – 95%
Maximum wet bulb	28° C (82° F)	46° C (115° F)
Minimum dew point	2° C (36° F)	N/A
Maximum altitude	24,000 m (8000 ft)	49,000 m (16,000 ft)
Power cord	Attached, 3-conductor grounded, 5-15P plug; detached for all International and Low Magnetic Field versions.	

* VT420 International and Low Magnetic Field models only

VT420 with PCTerm Text Terminal



VT420 with PCTerm is a multi-personality video text terminal adapted to the needs of users in the UNIX and multi-user DOS markets. It is particularly suited to timesharing on INTEL 386/486-based computers using operating systems supplied by the Santa Cruz Operation (SCO) or multi-user DOS companies. This model will be of interest to other UNIX users or to users who prefer a PC-style keyboard.

VT420 with PCTerm includes the industry-standard enhanced 101/102 key PC-style keyboard and PCTerm capabilities. These include: the standard PC character set, 25-line presentation, and XPC XON/XOFF communications protocol. These additional capabilities adapt to operating systems such as SCO/UNIX, UNIX and multi-user DOS.

VT420 with PCTerm provides the user with dual sessions in PC (50 lines) and VT (48 lines) modes, copy and paste, rectangular area operations, and downline loadable macros. SSU (Session Support Utility) is supported in VT mode. See Chapter 9, *Software and Services,* for more information on SSU software.

As a multi-personality terminal, the user can operate the terminal with two sessions in either mode:

- PCTerm Mode: This mode is adapted to the standards and expectations of UNIX and multiuser DOS operating system users. With the enhanced PC-style keyboard and screen presentation, the VT420 with PCTerm terminal is the appropriate interface device.
- VT/PC mode: In this mode, VT420 with PCTerm can function as a standard VT420 terminal with a PC keyboard.

Features

- Displays 800- × 414-pixel resolution at a flicker-free 70-Hz refresh rate with full overscan
- Provides superior presentation clarity
- 3-year return-to-factory warranty
- Provides advanced functionality of the standard VT420 in both the 80- and 132-column settings
- Multi-personality terminal emulation: PCTerm mode and VT/PC mode
- Includes PC character set and PC keyboard scan codes
- Term Cap/Term Info files are available for most popular UNIX operating systems
- Complies with Swedish MPR II low emissions (LE) requirements

Ordering Information

VT420 PCTerm terminal includes paper white screen and international power supply. MPR II low emissions compliance is standard in all models.

VT42A-SA	U.S./English
VT42A-SB	Belgium/Flemish
VT42A-SD	Denmark/Danish
VT42A-SE	U.K., Ireland/English
VT42A-SF	Finland, Sweden/Finnish, Swedish
VT42A-SG	Germany, Austria/German
VT42A-SH	Holland/Dutch
VT42A-SI	Italy/Italian
VT42A-SK	Switzerland/French, German
VT42A-SN	Norway/Norwegian
VT42A-SP	France/French
VT42A-SS	Spain/Spanish
VT42A-SV	Portugal/Portuguese
VT42A-AZ	Australia, New Zealand/English

Specifications

Physical Characteristics				
	Weight	**Height**	**Width**	**Depth**
Monitor Box	8.5 kg (18.7 lb)	31.2 cm (12.3 in.)	31.5 cm (12.4 in.)	33.0 cm (13 in.)
Keyboard	1.4 kg (3 lb)	4.5 cm (1.75 in.)	4.78 (18.8 in.)	19.1 cm (7 in.)

Environment		
	Operating	**Storage**
Temperature	10° to 40° C (50° to 104° F)	–40° to 66° C (–40° to 151° F)
Relative humidity	10% to 90%	50% to 95%
Maximum wet bulb	28° C (82° F)	46° C (115° F)
Minimum dew point	2° C (36° F)	N/A
Maximum altitude	24,000 meters (8000 ft)	49,000 meters (16,000 ft)

Electrical	
Voltage	88 to 264 V – single phase, three wire
Frequency range	47 to 63 Hz
Power cord	Detached 3-conductor grounded, 5-15 plug

Specifications by Mode of Operation

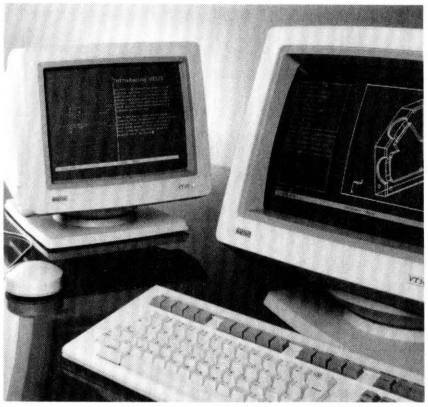
	Single Session		Dual Session		Combined Dual Session
Screen Characteristics	**VT/PC**	**PCTerm**	**VT/PC**	**PCTerm**	**VT/PC: PCTerm**
Display:					
Data lines per session	24/25/36/48/50	25	24/25/36/48/50	25	24/25/36/48/50:25
Session status line	Yes	No	Yes	No	Yes:No
Terminal indicator line	Yes	Yes	Yes	Yes	Yes:Yes
Page(s):					
Number of columns	80/132	80	80/132	80	80/132:80
Rows					
Pages per session	6	1	3	1	3:1
Advanced programming functions:					
Text windows (rectangular area op.)	Yes	Yes	Yes	Yes	Yes:Yes
Horizontal/vertical scrolling	Yes	Yes	Yes	Yes	Yes:Yes
Local macros	Yes	Yes	Yes	Yes	Yes:Yes
Redefinable characters sets (RDCS)	2	2	2:2	2:2	2:2
Programmable function keys:					
Number keys per session (UDKs)	48	N/A	48	N/A	48:N/A
Memory per session	1.5K	N/A	768 bytes	N/A	768:N/A
Dual sessions:					
Single wire	N/A	N/A	Yes	No	No:No
Dual wire	N/A	N/A	Yes	Yes	Yes:Yes
Split screen viewing:					
Lines per session	N/A	N/A	24–50	25:25	25:25
Dynamic viewing adjustment	N/A	N/A	Yes	No	Yes:No
Local copy/paste:					
Within session	Yes	No	Yes	No	Yes:No
Between sessions	N/A	N/A	Yes	No	No:No

Specifications *(Continued)*

Screen Characteristics

Screen attributes:	
Cursor selection	On/off, block/underline, blink/steady
Attributes	Normal, reverse, underline, bold, blink, double width, double height, double height/width
Scrolling	
Types	Vertical and horizontal on full display or within defined rectangular region
Rates	Jump, scroll 2 (9 lines per second), scroll 4 (18 lines per second)
Keyboards LK443/LK444 (U.S./International)	101- or 102-key, tactile quality, full matte finish, sculptured key caps, volume selection for keyclick, margin bell, and warning bell
Local memory:	Single Session Mode:
Page configuration	6 pages of 24 lines; 5 pages of 25 lines; 4 pages of 36 lines; 3 pages of 48 lines; 2 pages of 72 lines; 1 page of 144 lines
Macro buffer	6,000 bytes
	Dual Session Mode (per session):
Page configuration	3 pages of 24 lines; 2 pages of 25 lines; 2 pages of 36 lines; 1 page of 48 lines; 1 page of 72 lines
Macro buffer	6,000 bytes
Addressable by	Page(s), rectangle(s), line(s), character(s)
Rectangular operations	Copy, fill, erase, change attributes, insert/delete columns
Character sets	ASCII, DEC supplemental, DEC Special Graphics, ISO Latin-1, DEC technical, 7-bit NRCS, PC International
Communications	Full-duplex asynchronous with selectable local echo and full modem control. 7-bit or 8-bit character
Speeds	300 to 38.4K Baud
Interface	One DEC-423 (MMJ), one EIA-232 25-pin, and one printer port (MMJ).
Printer port	Full bidirectional communications; assignable to either session or shared between sessions; supports Digital desktop printers. May alternately be configured in set up as second DEC-423 port for 2-wire dual session.
Power cord/power supply	Detached, auto range 120–240 V.
Standards	FCC class B, GS certification, UL, CSA, IEC, VDE-B. Low Emissions (LE)—Swedish Radioprotection Institute (SRI) conformance on low frequency magnetic fields and low electrostatic fields.

VT340+ Graphics Terminal



The VT340+ color graphics terminal provides high-resolution and high-quality fully-formed characters. The VT340+ has a 13-inch screen and can display up to 16 colors from a palette of 4096. It features a 25th status line. For operator viewing comfort, it includes a pedestal with tilt and swivel capabilities.

VT340+ terminals offer a three-year warranty.

VT340+ terminals offer features such as a bidirectional printer port for connecting a local printer or an alternate input device and the ability to connect to more than one host over a single wire. Because they do not have cooling fans, they are quiet and their covers hide all cables to provide a clean appearance.

A MicroDIN connector is provided with the VT340+ terminal to connect an optional mouse or tablet which is supported in ReGIS and Tektronix 4010/4014 graphics modes.

Improved performance is due to Digital's proprietary graphics chipset, the same graphics processors used in Digital's high-end workstations. They offer full text and graphics capabilities including support for the ReGIS and Tektronix 4010/4014 graphics protocols.

Ordering Information

For quantity orders (25+) or when ordering any VT300 series terminal with a system, or upgrade, use the DL prefix. For orders of quantities from 1–24, use the order numbers listed, without a prefix.

U.S.	**VT340-GA**	Color graphics terminal with standard keyboard, 120 V
	VT340-KA	Color graphics terminal with WPS keyboard, 120 V
Belgium	**VT340-GB**	Color graphics terminal with standard keyboard, 240 V
	VT340-KB	Color graphics terminal with English keyboard, 240 V
Canada	**VT340-GC**	Color graphics terminal with standard keyboard, 120 V
	VT340-KC	Color graphics terminal with French WPS keyboard, 120 V
Denmark	**VT340-GD**	Color graphics terminal with standard keyboard, 240 V
	VT340-KD	Color graphics terminal with English keyboard, 240 V
U.K./Ireland	**VT340-GE**	Color graphics terminal with standard keyboard, 240 V
	VT340-KE	Color graphics terminal with WPS keyboard, 240 V
Finland	**VT340-GF**	Color graphics terminal with standard keyboard, 240 V
	VT340-KF	Color graphics terminal with English keyboard, 240 V
Germany/ Austria	**VT340-GG**	Color graphics terminal with standard keyboard, 240 V
	VT340-KG	Color graphics terminal with English keyboard, 240 V
Holland	**VT340-GH**	Color graphics terminal with standard keyboard, 240 V
	VT340-KH	Color graphics terminal with English keyboard, 240 V
Italy	**VT340-GI**	Color graphics terminal with standard keyboard, 240 V
	VT340-KI	Color graphics terminal with English keyboard, 240 V
Switzerland (French)	**VT340-GK**	Color graphics terminal with standard keyboard, 240 V
	VT340-KK	Color graphics terminal with English keyboard, 240 V
Switzerland (German)	**VT340-GL**	Color graphics terminal with standard keyboard, 240 V
	VT340-KL	Color graphics terminal with English keyboard, 240 V
Sweden	**VT340-GM**	Color graphics terminal with standard keyboard, 240 V
	VT340-KM	Color graphics terminal with English keyboard, 240 V
Norway	**VT340-GN**	Color graphics terminal with standard keyboard, 240 V
	VT340-KN	Color graphics terminal with English keyboard, 240 V
France	**VT340-GP**	Color graphics terminal with standard keyboard, 240 V
	VT340-KP	Color graphics terminal with English keyboard, 240 V
Spain	**VT340-GS**	Color graphics terminal with standard keyboard, 240 V
	VT340-KS	Color graphics terminal with English keyboard, 240 V
Portugal	**VT340-GV**	Color graphics terminal with standard keyboard, 240 V
	VT340-KV	Color graphics terminal with English keyboard, 240 V
Australia/ New Zealand	**VT340-GZ**	Color graphics terminal with standard keyboard, 240 V
	VT340-KZ	Color graphics terminal with WPS keyboard, 240 V

Ordering Information
(Continued)

Accessories and Supplies

For more information, refer to the *DECdirect* catalog.

VT2XX-AA	VT200/VT300 family system stand
VSXXX-AA	Mouse
VSXXX-EB	Mouse pad
VSXXX-AB	Graphics tablet
VSXXX-HA	DECwand bar code reader, 6 mil aperture, visible red light
VSXXX-HB	DECwand bar code reader, 8 mil aperture, visible red light
VT3XX-XX	VT220/VT320 monitor arm
H8673-AA	20 mA active host Mate-N-Lok to EIA-423 DECconnect MMJ passive converter
H8673-AB	20 mA active host RJ11 (6 pin) to EIA-423 DECconnect MMJ passive converter

Specifications

Physical Characteristics		
Height	36.83 cm (14.5 in.)	
Width	39.4 cm (15.5 in.)	
Depth	42.9 cm (16.9 in.)	
Weight	15.4 kg (34.0 lb)	
Screen Characteristics		
Type	13-inch convex anti-glare CRT	
Resolution	800 pixels × 500 lines	
Shades	16 colors from a palette of 4096	
Display format	Full screen, 24 lines plus 25th status line; vertical split screens for session 1 and 2; horizontal split screens (variable) for session 1 and 2	
Column/rows: Cell Size	80-column mode 10 × 20; 132-column mode 6 × 20	
Character Size	80-column mode, 8 or 9 × 11; 132-column mode, 4 or 5 × 9	
Local memory	Single session mode: 6 pages @ 24 lines; 4 pages @ 36 lines; 2 pages @ 72 lines; 1 page @ 144 lines Dual session mode: 3 pages @ 24 lines; 2 pages @ 36 lines; 1 page @ 72 lines Graphics storage: two full screen graphics images	
Operating Environment		
Temperature	10° to 40° C (50° to 104° F)	
Relative humidity	10% to 90%	
Altitude	9.1 km (30,000 ft)	
Power Requirements		
Voltage	120 V	240 V
Frequency	50–60 Hz	50–60 Hz
Phases	Single	Single
Current ac amps (maximum)	1.16	2.1
NEMA receptacle type	5-15R	5-15R
Heat dissipation	222 Btu/h	376 Btu/h
Thermal dissipation (Watts)	60	60

IT330 and IT340 Industrial Terminals

The IT330 and IT340 industrial terminals consist of VT330 and VT340 graphics terminals packaged in rugged, sealed NEMA-12 enclosures. They have the same text and graphics capabilities as Digital's VT330 and VT340 terminals. NEMA-12 sealing protects the terminals from failures caused by dirt, airborne particles, noncorrosive liquids, and leaking oil or coolants. Tough enclosures protect the terminals from vibration or rough handling, and a high-impact shield protects the monitors against breakage. Their unique, passive cooling design lets the terminals withstand higher operating temperatures than ordinary office terminals. The IT3XX-AA membrane keyboard and IT3XX-AB tactile keyboard, also sealed to NEMA-12 standards, are available for both the IT330 and IT340. Optional rackmount and wallmount kits are available for both IT330/340 terminals and IT3XX keyboards.

Note: All IT330 terminals are graphics terminals with NEMA-12 enclosures.

Ordering Information

IT330-A2/A3	Monochrome, white phosphor, VT330 functionality, 120 V/240 V.
IT330-B2/B3	Monochrome, green phosphor, VT330 functionality, 120 V/240 V.
IT330-C2/C3	Monochrome, amber phosphor, VT330 functionality, 120 V/240 V.
IT340-A2/A3	Color, Northern Hemisphere, VT340 functionality, 120 V/240 V.
IT340-A5	Color, Southern Hemisphere, VT340 functionality, 240 V.

Note: Terminal order numbers do not include the keyboard.

IT3XX-AA	NEMA-12 flat membrane keyboard.
IT3XX-AB	NEMA-12 tactile keyboard.
IT3XX-RA	Rackmount kit for IT330 and IT340.
IT3XX-WA	Wallmount kit for IT330 and IT340.

Note: For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

VTN-Series Industrial Terminals

The VTN-Series of industrial terminals features VT330 and VT340 terminals packaged in NEMA-2 enclosures, a standard that protects from falling dirt and splashing noncorrosive liquids while the rugged enclosures protect from rough handling.

Designed to operate in light industrial environments where office-grade equipment would fail, the VTN terminals can be located next to a manufacturing process or assembly area, providing convenient graphics capability. The optional rackmount kit allows installation in industry-standard 19-inch racks or cabinets. Alternatively, they can sit on a tabletop.

Ordering Information

VT33N-A2/A3	VT330 graphics terminal, NEMA-2 enclosure, monochrome, white phosphor, no keyboard, 120 V/240 V.
VT33N-B2/B3	VT330 graphics terminal, NEMA-2 enclosure, monochrome, green phosphor, no keyboard, 120 V/240 V.

Ordering Information
(Continued)

VT33N-C2/C3	VT330 graphics terminal, NEMA-2 enclosure, monochrome, amber phosphor, no keyboard, 120 V/240 V.
VT34N-A2/A3	Color VT340 graphics terminal, NEMA-2 enclosure, no keyboard, 120 V/240 V.
IT3XX-AA	NEMA-12 flat membrane keyboard for VT33N/34N and IT330/340.
IT3XX-AB	NEMA-12 rubber keyboard for VT33N/34N and IT330/340 terminals.

For non-120-V systems, order a power cord based on the particular country.

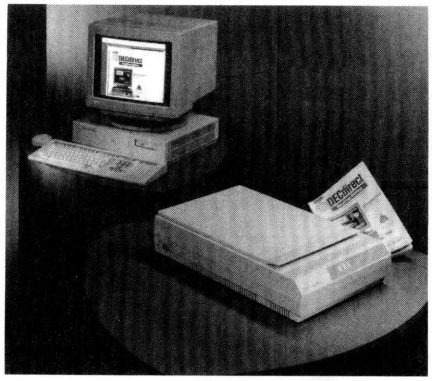
BN19A-2E	United Kingdom, Ireland
BN19C-2E	Austria, Belgium, France, Germany, Finland, Holland, Norway, Sweden, Portugal, Spain
BN19E-2E	Switzerland
BN19H-2E	Australia, New Zealand
BN19K-2E	Denmark
BN19M-2E	Italy
BN19S-2E	India

Note: For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

Specifications

Environmental Characteristics			Physical Characteristics				
Operating Temperature	**Relative Humidity**	**Code Standards**	**Height**	**Width**	**Depth**	**Weight VT33N**	**Weight VT34N**
10° C to 40° C	20% or less	NEMA-2,	40.0 cm	44.5 cm	45.72 cm	27.5 kg	32.6 kg
50° F to 104° F	to 80%	FCC Class A	15.75 in.	17.2 in.	19.1 in.	61.0 lb	72.0 lb

MD30C Color Scanner



The MD30C is an affordable, desktop 300-dpi scanner that works with workstations and personal computers running software that transfers scanned data into computer files. The MD30C color scanner and associated software allow scanned-in data to be displayed on the computer screen, then modified, stored, or printed.

In color mode, the MD30C scanner scans full-color images to enhance office documents or create effective illustrations. It also provides accurate representations of black-and-white (bitonal or grayscale) hardcopy information, including photographs. The scanner offers 16.4 million shades of each color or up to 256 shades of gray.

The MD30C scanner works with DECimage Scan Software on workstations in VMS and RISC ULTRIX environments and with Image-In Color scanning software on PCs to easily transfer scanned data into usable computer files. The scanning software then allows scanned images to be previewed, cropped, rotated, washed, inverted, or magnified.

On VAX VMS and RISC ULTRIX platforms, DECimage character recognition software allows scanned-in hardcopy text to be converted to ASCII, PostScript, or Digital Document Interchange Format (DDIF) files. Scanned-in data can also be integrated into new or existing documents, or mailed electronically over the network. The MD30C scanner can also be used with CDA-compliant publishing software, such as DECpresent and DECwrite.

Features

- Captures text, line art, and photographs in original hardcopy form and transfers them into the computer system
- Offers color, grayscale and bitonal scanning to give accurate representation of all hardcopy images
- Provides affordable alternative to rekeying text or recreating artwork on the system
- Scans at 300 dpi in 10 seconds in bitonal mode, 37 seconds in grayscale mode, and 130 seconds in color mode
- Requires no special operator training

Prerequisites

Workstations

Hardware

- VAXstation 3100
- VAXstation 4000
- DECstation 3100
- DECstation 5000
- 6 Mbytes of memory
- RZ24 209-Mbyte disk drive
- VT Series color monitor

Software

- VMS Version 5.4-2 or later
- DECwindows Motif Version 1.0
- DECnet VAX V5.3-V5.5 Open (Phase IV End Node) for remote
- Scanning and mail
- DECimage Scan Software for
- VMS V3.0

Personal Computers

Hardware

- DECstation 320, 325, 333, 425
- DECpc 433
- IBM PC compatibles
- 2 Mbytes of memory (four recommended for editing color images)
- 70 Mbytes of disk storage
- VGA, 8514, XGA or any Windows-compatible display with resolution of at least 640 × 480; 256-color or true-color; 24-bit display recommended

Software

- MS-DOS V3.3 or later; Microsoft Windows V3.0

MD30C Color Scanner

Ordering Information

The MD30C color scanner is offered in four configurations: hardware-only, with VMS license, with RISC ULTRIX license, and with Image-In Color license.

Note: -Ax = hardware only; -Bx = with VMS license; -Cx = with Image-In Color license; -Dx = with RISC ULTRIX license.

MD30C-AA	MD30C scanner for U.S./Canada; hardware only
MD30C-BA	MD30C scanner for U.S./Canada; with VMS license
MD30C-CA	MD30C scanner for U.S./Canada; with Image-In Color license
MD30C-DA	MD30C scanner for U.S./Canada; with RISC ULTRIX license

Note: For international models, replace A with: D = Denmark; E = U.K./Ireland; I = Italy; J = Japan; K = Switzerland; T = Israel; Z = Australia/New Zealand; X = Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden

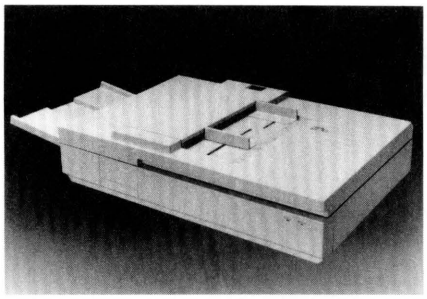
Accessories

MD3XC-HA	Fluorescent bulb, 8 watts
BC56H-06	SCSI cable for workstations
BC19J-06	SCSI cable for PCs
PC4XR-CC	16-bit SCSI adapter for PCs
12-30552-01	SCSI terminator

Specifications

Physical Characteristics	
Height	120 mm (4.7 in.)
Width	353 mm (13.9 in.
Depth	545 mm (21.5 in.)
Weight	11 kg (24 lbs.)
Performance Characteristics	
Resolution	Up to 300 dpi
Scanning Speed	Bitonal (10 seconds) Grayscale (37 seconds) Color (130 seconds)
Document Size	Up to 8.5 × 14 in. (216 mm × 356 mm)
Operation Mode	Bitonal 8-bit grayscale 24-bit color
Interface	SCSI-2
Operating Environment	
Noise Level	< 55 dBA
Operating Temperature	10° to 40° C (50° to 104° F)
Relative Humidity	35% to 80%
Power Consumption (Watts)	40
Regulatory Compliance	UL, CSA, FCC, VDE, VCCI, ZZF

MD410 Document Image Scanner



The MD410 is a departmental document scanner. The MD410 product is a SCSI, grayscale, 15-page-per-minute (at 200 dots per inch), desktop, document image scanner with automated document feeder (ADF). It is manufactured by Ricoh and distributed by Digital for use with DECimage compatible software solutions to address customer needs in the document image management market.

With a VAXstation and an image capture capability (MD410 Scanner/DECimage Scanning Software), information on paper—photographs, line drawings, business forms, engineering sketches, etc.—can be entered into the computer-based information system of the workgroup, department, or enterprise.

The software features pull-down menus and windows, and uses keyboard and mouse input for easy operation. This capability not only scans images but also accepts any image file that conforms to Digital's Document Interchange Format (DDIF). This includes images from DECimage EXpress, Digital's first preconfigured document image management system.

Once scanned into the system, the image can be displayed on a workstation, modified, stored, mailed electronically, or incorporated into compound documents using DECwrite, VAX DOCUMENT, or a number of third-party compound document editors. It can be used across all industries where there is a requirement to reduce paper-intensive operations to easily managed, retrievable electronic images.

Features

- Customer installable
- Scanning system: stationary flat bed
- Simplex scanning
- Scanning area: maximum of B size paper (11-inch × 17-inch)
- 50-page automatic document feeder (ADF) for 3-inch × 5-inch to 11-inch × 17-inch documents
- Maximum 15 pages per minute at 200 dpi
- Up to 17,000 pages/month per scanner
- Bitonal and grayscale scanning
- Grayscale: 8 bits per pixel (256 gray levels)
- 75 to 400 dots per inch (dpi) resolution
- Optional hardcopy endorser
- SCSI-2 interface
- Onboard compression

Compatible Applications/Solutions

The MD410-AA scanner is compatible with DECimage Application Services (DAS) V3.0 development toolkit and with two currently available DECimage software applications:

- **Standalone**—The MD410 scanner can be used to capture images with a single-user software application called DECimage Scan Software (DSS).

  The DECimage Scan Software product is a VMS-DECwindows application to operate the MD410 from a VAXstation 3100 as a standalone image capture/acquisition workstation. Images captured and adjusted with DSS are stored in DDIF-compatible files which can be used by other applications (e.g., DECwrite) that use image data.

Compatible Applications/Solutions *(Continued)*

- **In DECimage EXpress**—The MD410 is the primary input device for the multi-user document image management software solution, DECimage EXpress V1.0.

DECimage EXpress is Digital's first preconfigured VMS document image management system using a combination of standard and custom hardware and software products to meet development and product workgroup needs.

Performance

Performance is a function of two overall parameters: speed of the scanner and throughput capabilities of the workstation plus application(s) that drive the scanner. Most typical end-user configurations result in a throughput in the "nominal" range. The upper end of the throughput range is attainable only with the most streamlined configuration and scanner settings.

Testing configuration:	VAXstation 3100/40 with 16-Mbyte memory running VMS V5.4 and DSS V2.1		
Settings:	Bitonal, scanner compression ON		
Images scanned:	Ten 8.5- × 11-inch pages using ADF mode		
Scanner resolution:	100 dpi	200 dpi	300 dpi
Nominal throughput:	17–14 ppm	15–11 ppm	10.5–10 ppm

Notes:
Average time/sheet calculated, high and low times discarded, translated to pages per minute.

Throughput is defined as scanning the documents and storing the compressed image on internal disk.

Some scanner features (e.g., endorser, grayscale, uncompressed scanning) will significantly slow scanner throughput below the nominal range.

Prerequisites

Hardware

- VAXstation 3100 Models 30, 40, 38, 48, or 76
- One 50-pin SCSI terminator
- One SCSI interconnect cable (BC56H—68-pin to 50-pin)
- For daisychaining: one BC19J—50-pin to 50-pin interconnect cable

Software

- VMS V5.4
- DECimage Scan Software V2.1 plus associated prerequisites OR
- DECimage EXpress V2.0 plus associated prerequisites OR
- DECimage Application Services V3.0 for VMS

Ordering Information

MD410-AA	MD410 document image scanner, includes 120-V power cord; requires SCSI interconnect cable.
MD410-A3	MD410 document image scanner, requires SCSI interconnect cable and 240-V power cord from the following list:
BN19P-1K	U.S., Canada
BN19A-2E	U.K., Ireland
BN19W-2E	Austria, Belgium, Finland, France, Germany, Holland, Norway, Portugal, Spain, Sweden
BN19E-2E	Switzerland
BN19H-2E	Australia, New Zealand
BN19K-2E	Denmark
BN19Z-2E	Italy
BN19S-2E	India
BN19U-2E	Israel

Ordering Information
(Continued)

Accessories and Supplies

MD41X-EA	Programmable hardcopy endorser for MD410-AA/A3
MD41X-RA	5-pack of replacement rollers for MD41X-EA endorser
MD41X-LA	Lamp replacement for MD410-AA/A3
MD41X-SA	User-replaceable separation roller

Specifications

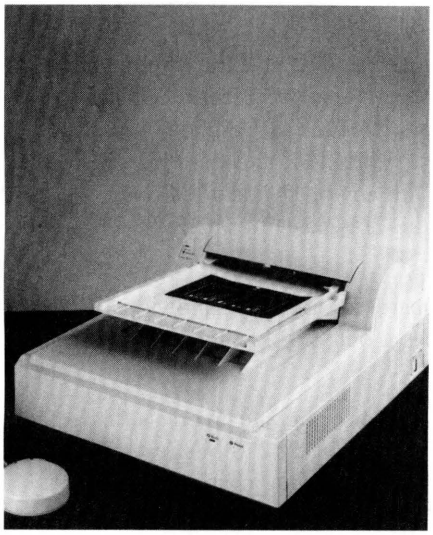
Physical Characteristics	
Height	18 cm (7.1 in.)
Width	69.8 cm (27.5 in.)
Depth	50 cm (19.7 in.)
Weight	38.2 kg (84 lb)

Power Requirements	
Voltage	120 V
Frequency	45–65 Hz
Phases	1
Current ac amps (maximum)	1.5
Thermal dissipation (Watts)	123
Thermal dissipation (Btu/h)	420

Operating Environment	
Temperature	41° to 98° F (5° to 35° C)
Relative humidity	30% to 85%

For additional information on the MD410, or DECimage EXpress V1.0, contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.

MD400 Document Image Scanner



The MD400 is a document scanner for use with DECimage-compatible software solutions to address customer business needs at the workgroup level of the document image management market. The MD400 product is a SCSI, grayscale, 6- to 8-page-per-minute desktop, document image scanner for use with VAXstation 3100 Models 30, 40, 38, 48, and 76. An optional automatic document feeder (ADF) is available.

The MD400 is compatible with two currently available DECimage software applications:

- **Standalone**—The MD400 as a standalone image capture device with a single user software application, called DECimage Scan Software (DSS).
- **DECimage EXpress**—The MD400 is an image-capture device for the multiuser document image management software solution called DECimage EXpress V1.0.

The DECimage Scan Software (DSS) product is a VMS-DECwindows application that operates the MD400 from a VAXstation 3100 as a standalone image capture/acquisition workstation. Images captured and adjusted with DSS are stored as DDIF-compatible files which can be used by other applications (i.e., DECwrite) that use image data.

Features

- Customer installable
- Scanning system: stationary flat bed
- Simplex (single-sided) scanning
- Scanning area: maximum 8 1/2 × 14 inches
- Optional 30-page automatic document feeder
- Speed: 7 pages per minute at 300 dots per inch
- Volume: Up to 1000 pages/month per scanner
- Bitonal and grayscale scanning
- Resolution: 75 to 400 dots per inch
- Interface: SCSI

For a custom quote or additional information, contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.

2D and 3D Programmable Peripherals for CAD/CAM/CAE

The Lighted Programmable Function Keyboard (LPFK) and the Programmable Function Dials (PFD) are workstation peripherals that complement Digital's hardware and software solutions for the Computer-Aided Design (CAD) and Computer-Aided Engineering (CAE) markets. The LPFK and the PFD can be used either individually or simultaneously with any of Digital's VMS or ULTRIX/RISC-based workstations through the EIA-232-D (formerly RS-232-C) serial port.

The Lighted Programmable Function Keyboard consists of 32 individually programmable pushbuttons. Each button has a built-in LED and can be programmed for specific application usage.

The Programmable Function Dial Box consists of eight valuator dials that rotate 360 degrees. The dials divide 360 degrees of rotation by 256 bits (each bit corresponds to approximately 1.4 degrees per incremental change in rotation). The function of each dial is defined by the application program and is typically used to rotate and translate screen images.

The Peripheral Control Module is an intelligent interface box that provides individual or simultaneous access for both the LPFK and the PFD by multiplexing these two peripheral devices to one common EIA-232-D serial port.

Features

- Fully compatible with all Digital workstations running VMS or ULTRIX/RISC.
- Supported by DEC Programmers' Hierarchical Interactive Graphics System (DEC PHIGS) graphics standard. The PFD provides hardware for VALUATOR input and LPFK provides hardware for CHOICE input.
- Fully programmable LPFK and PFD to support a variety of applications.

Ordering Information

The following peripherals may be ordered either in a packaged format or as single units. These packages include the Peripherals Control Module (PCM), exercisers, power supply, cables, and user documentation.

VSX10-AA/A3	Combination LPFK and PFD package, 120 V/240 V
VSX20-AA/A3	Lighted Programmable Function Keyboard, 120 V/240 V
VSX30-AA/A3	Programmable Function Dial box package, 120 V/240 V

The following single units include the unit with its integral cable.

VSXXA-KA	Lighted Programmable Function Keyboard and cable. Prerequisites: Peripheral control module and power supply.
VSXXA-DA	Programmable Function Dials and cable. Prerequisites: Peripheral control module and power supply.
VSXXA-CA	Peripheral Control Module—includes cable to the workstation, user documentation, and exerciser. Prerequisite: power supply.
H7824-AA/AB	Power supply, 120 V/240 V.

For additional information, contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.

Printers Introduction

Overview

The DECprint Architecture is Digital's model for printing. It meets the needs for distributed printing and for managing a variety of printers. The DECprint Architecture supports the ANSI and ISO DPA standards and the PostScript page description language used on Digital's printers. It also supports other page description languages.

Through Network Application Support (NAS) print services, the DECprint Architecture provides standardized software interfaces to the printing system, which enables application developers, OEMs, and ISVs to add new features. Third parties conforming to industry standards can connect directly to the Digital printing system.

DECprint Architecture offers the following features:

- Integrates networked, heterogeneous systems (VMS, ULTRIX, UNIX, MS-DOS, Macintosh, and OS/2) and their printers into a single printing system.
- Simplifies the user's interface to the printing system.
- Simplifies the programming interface to the printing system through standardized software interfaces.
- Simplifies the configuration and management of the printing system for system managers.

Within the DECprint Architecture, printers should be selected based on the user and system environments and the network interconnection. Printers must be considered part of the whole system and not just as peripherals.

The following are conditions that must be considered before deciding which printer best fits a given application:

- Number of users and their locations
- Types of tasks to be performed
- Amount of floor space or table space available
- Computers to which printers connect
- Geographic location of computers
- Low cost per page (PrintServers) vs. user convenience (desktop printers)
- Method of interconnection among computers
- Type and size of documents printed
- Need for duplex (two-sided) printing
- Need for multiple images on a single side
- Need for multiple and/or mixed forms (letterhead, envelopes, overhead transparencies, etc.)
- How quickly printouts are needed
- Volume of printing (pages per month)
- User care at specific print volume intervals

Consider printing requirements when selecting a printer from the following technologies:

Nonimpact Printers

- Laser (PrintServers and desktop)
- Ink-jet
- Thermal transfer

Impact Printers

- Dot-matrix
- Line dot-matrix
- Print band

Nonimpact Printers Comparison Chart

	turbo PrintServer 20 (LPS20)	PrintServer 40 *Plus* (LPS40 *Plus*)	DEClaser 1100/1150 (LN07)	DEClaser 2100 plus/ 2150 plus (LN05)	DEClaser 2200 plus/ 2250 plus (LN06)
Technology	Laser	Laser	Laser	Laser	Laser
Speed (maximum 8.5 x 11-in. pgs/minute)	20—simplex 16 sides—duplex	40	4	8	8
Recommended impressions/month (maximum)	Up to 70,000	Up to 100,000	Up to 6,000	Up to 16,000	Up to 20,000
Number of colors	1	1	1	1	1
Paper type	Cutsheet, labels (specified stock required), transparencies			Cutsheet, labels (special stock required), transparencies, envelopes	
Paper thickness	18–24 lb	16–24 lb	16–24 lb	16–21 lb	16–21 lb
Multipart forms	No	No	No	No	No
Paper sizes	7.5 × 10.5, 8.5 × 11, 8.5 × 14, 11 × 17 inches, ISO A3, ISO A4, JIS B5	7.5 × 10.5, 8.5 × 14, 11 × 17 inches, ISO A3, ISO A4, JIS B4	7.5 × 10.5, 8.5 × 11 8.5 × 14 inches, ISO A4	7.5 × 10.5, 8.5 × 11, 8.5 × 14 inches, ISO A4	7.5 × 10.5, 8.5 × 11, 8.5 × 14 inches, ISO A4
Resident fonts	29 PostScript scalable	29 PostScript scalable	43 PostScript (1150)	43 PostScript (2150 Plus)	43 PostScript (2250 Plus)
Optional fonts	Downloadable	Downloadable	Downloadable or font cartridges	Downloadable or font cartridges	Downloadable or font cartridges
Characters/inch	*	*	*	*	*
Lines/inch	*	*	*	*	*
Graphics protocols	PostScript, HP PCL, DDIF, ANSI/Sixel, ReGIS, Tektronix 4010/4014 (VMS) ANSI/Sixel (ULTRIX RISC); ASCII text (UNIX)	PostScript, HP PCL, DDIF, ANSI/Sixel, ReGIS, Tektronix 4010/4014 (VMS) ANSI/Sixel (ULTRIX RISC); ASCII text (UNIX)	PostScript (DEClaser 1150), (ANSI/Sixel, ReGIS, Tektronix 4010/4014)	DEC PPL3 (ANSI-compliant), PostScript (DEClaser 2150 plus), HP PCL-4, ANSI/Sixel ReGIS, Tektronix 4010/4014, DDIF LaserWriter	DEC PPL3 (ANSI-compliant), PostScript (DEClaser 2250 plus), HP PCL-4, ANSI/Sixel ReGIS, Tektronix 4010/4014, DDIF LaserWriter
Resolution (dots per inch)	300 × 300	300 × 300	300 × 300	300 × 300	300 × 300
Bar codes	Yes, through ANSI translator and application software		Yes, optional cartridge or application software	Yes, optional cartridge (Code 3 of 9) or ON-TAP software	Yes, with ON-TAP software in ANSI mode
Interfaces	Ethernet	Ethernet	EIA-232 EIA-423 (with optional adapter)	EIA-232	EIA-423
IBM PC-compatible	Yes, with optional software	Yes, with optional software	Yes	Yes	Yes
RAM (standard)	12 MB	8 MB	.5 MB	.5 MB, 2.5 MB (2150 Plus)	1 MB, 5 MB (2250 Plus)
Noise level	<55 dBa	57 dBa	<54 dBa	<54 dBa	<54 dBa
Dimensions W x D x H	37 × 27 × 50 in. 93.5 × 69 × 126 cm	60 × 28 × 40 in. 152 × 72 × 103 cm	13.8 × 15.9 × 8 in. 35 × 40.5 × 20.4 cm	17.9 × 20.7 × 9 in. 45.4 × 52.5 × 22.8 cm	17.9 × 27 × 12.3 in. 45.4 × 66.5 × 32.2 cm
Weight	345 lb (155 kg)	485 lb (220 kg)	25 lb (11.5 kg)	45.5 lb (20.6 kg)	67.1 lb (30.4 kg)

* Varies depending on fonts used.

Nonimpact Printers Comparison Chart

	DEClaser 3200/3250 (LN08)	DECjet 1000	DECjet 2000	Companion Color Printers (LJ250/LJ252)	Colormate PS (LF01)
Technology	Laser	Bubble ink jet with 50-nozzle pinhead	Bubble ink jet with 50-nozzle pinhead	Color ink-jet Drop on demand	Color thermal wax
Speed (maximum 8.5 x 11-in. pgs/minute)	Up to 13 simplex Up to 11 duplex	Up to 160 ch/s	Up to 360 ch/s	3 (text) (167 ch/s)	3 (monochrome) 1 (color)
Recommended impressions/month (maximum)	Up to 35,000	Up to 400	Up to 800	Up to 500	Up to 1,500
Number of colors	1	1	1	7 plus white (255 shades)	over 700
Paper type	Cutsheet, labels (specified stock required), transparencies, envelopes	Cutsheet, transparencies, envelopes	Cutsheet, transparencies, envelopes	Cutsheet, fanfold, transparencies	Cutsheet, transparencies
Paper thickness	16–24 lb, up to 34 lb manual feed	19–24 lb, up to 36 lb manual feed	19–24 lb, up to 36 lb manual feed	26 lb	17–21 lb
Multipart forms	No	No	No	No	No
Paper sizes	8.5 x 11, 8.3 x 11.7, 7.25 x 10.5, 8.5 x 14 inches	8.5 x 11, 8.5 x 10.5, 8.5 x 14 inches ISO A4	8.5 x 11 in, 8.5 x 10.5, 8.5 x 14 inches, ISO A4	8.5 x 11 inches ISO A4	8.5 x 11 inches ISO A4
Resident fonts	43 PostScript (3250 Plus)	4	4	N/A	35
Optional fonts	Downloadable or font cartridges	7	7	HP PCL, downloadable	Downloadable
Characters/inch	*	5, 10, 12, 16.6, 20, 24	5, 10, 12, 16.6, 20, 24	5, 6, 9, 10, 12, 18	*
Lines/inch	*	*	*	2, 3, 4, 6, 8, 12	*
Graphics protocols	DEC PPL3 (ANSI-compliant), PostScript (DEClaser 3250 Plus), HP-PCL4, ANSI/Sixel ReGIS, Tektronix 4010/4014, DDIF LaserWriter	HP DeskJet Plus (standard), IBM ProPrinter (optional), Epson FX-850 (optional)	HP DeskJet Plus (standard), IBM ProPrinter (optional), Epson FX-850 (optional)	ANSI/Sixel, HP PCL, ReGIS (with optional RETOS software)	PostScript
Resolution (dots per inch)	300 x 300	300 x 300	300 x 300 600 x 300 (with optional fonts)	180 x 180 (8 colors) 90 x 90 (255 colors)	300 x 300
Bar codes	Yes, optional cartridge (Code 3 of 9) or ON-TAP software	Yes, through ON-TAP software	Yes, through ON-TAP software	Yes, through ON-TAP software	Yes, through ON-TAP software in ANSI mode
Interfaces	EIA-423, PC-compatible parallel interface, Novell Ethernet interface (customer installable)	Centronics parallel	Centronics parallel	EIA-232 EIA-423 (LJ250), Parallel (LJ252)	Parallel, serial EIA-232, EIA-422, AppleTalk
IBM PC-compatible	Yes	Yes	Yes	Yes, emulates HP PaintJet	Yes
RAM (standard)	1 MB, 7 MB (3250)	8 KB	8 KB	2 KB (input buffer)	8 MB
Noise level	55 dBa max. while printing; 53 dBa max. during standby	<45 dBa	<45 dBa	45 dBa	<53 dBa
Dimensions W x D x H	26.4 x 21.1 x 19.5 in. 67 x 53.6 x 49 cm	13.5 x 5.8 x 4.5 in. 34.2 x 14.7 x 11.5 cm	16.7 x 17.7 x 5.8 in. 42.5 x 45 x 14.7 cm	17.5 x 12.25 x 3.65 in. 44.5 x 31.1 x 9.3 cm	16.9 x 18.3 x 9.5 in. 43 x 46.5 x 24 cm
Weight	85 lb (38 kg)	6.4 lb (2.9 kg)	19.6 lb (9 kg)	10 lb (4.5 kg)	55 lb (25 kg)

* Varies depending on fonts used.

Impact Printers Comparison Chart

	LP37	LP29	LG31	LG06
Technology	Band	Band	Line dot-matrix	Dot-matrix
Speed	1200 lines/min, uppercase characters	Up to 2,000 lines/ minute, optimized band, uppercase characters	300 lines/minute uppercase characters, data processing mode	800 lines/minute (high speed) 255 (correspondence)
Recommended impressions/month (maximum)	150,000	300,000	25,000	75,000
Number of colors	1	1	1	1
Paper type	Fanfold, labels	Fanfold, labels	Fanfold, labels	Fanfold, labels cardstock, multipart forms (1–6)
Paper thickness (maximum)	0.020 in. (0.05 cm)	0.020 in. (0.05 cm)	0.025 in. (0.06 cm)	0.025 in. (0.06 cm)
Multipart forms	1–6	1–6	1–6	1–6
Width of output	3.5–18.75 in. 8.9–47.6 cm	3.5–18.75 in. 8.9–47.6 cm	4–16 in. 10.1–40.6 cm	4–16 in. 10.1–40.6 cm
Resident fonts	11	11	2	5
OCR-A/B	OCR-B	OCR-B	OCR-A/B	OCR-A/B
Characters per inch	10	10	5, 10, 12, 13.3, 15, 16.7	5, 10, 12, 13.3, 15, 16.7
Lines per inch	6, 8	6, 8	6, 8, 10	6, 8, 10
Graphics protocols	N/A	N/A	ANSI/sixel	ANSI/sixel, IBM ProPrinter emulation
Resolution (dots per inch)	Fully formed character	Fully formed character	120 H × 144 V	100 H × 100 V
Bar codes	No	No	Yes	Interleaved 2 of 5 Code 39, EAN 8 EAN, Code 11 Codebar a/n, b/n, c/*, d/e, UPC-A, E, POSTNET, optional ON-TAP software
Interfaces	Parallel (Data Products)	Parallel (Data Products)	EIA-232	EIA-232 (Centronics, Data Products)
IBM PC-compatible	No	No	No	Yes, through IBM ProPrinter emulation
Baud rate	N/A	N/A	9600	300–19,200
Buffer size	N/A	N/A	2 KB	1 K
Noise level	55 dBa	73 dBa	55 dBa	52 dBa
Dimensions W × D × H	31 × 35 × 44 in. 70.7 × 88.9 × 111.7 cm	35 × 49 × 49 in. 88.9 × 125.2 × 124.5 cm	29 × 40.6 × 46 in. 73.6 × 103.1 × 116.8 cm	27 × 28.7 × 40.6 in. 69 × 73 × 103 cm
Weight	350 lb (159 kg)	610 lb (274.5 kg)	285 lb (128.3 kg)	225 lb (102 kg)
Ribbon/ink technology	Reel-to-reel 50 M characters	Towel ribbon 100 M characters	Nylon cartridge 50 M characters	Nylon cartridge 20 M characters

Line Printer Interconnect Cabling

System Printer Interface	LP29	LP37	LG06	LG31
LP11	BC27A	BC27A	BC27A	N/A
LPV11	BC27A	BC27A	BC27A	N/A
LPV11-SA	BC27L	BC27L	BC27L	N/A
DMF32	BC27A	BC27A	BC27A	N/A
DMB32	BC27A	BC27A	BC27A	N/A
EIA-232	N/A	N/A	BC22D	BC22D

For more information on line printers, contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.

Impact Printers Comparison Chart

	LA424 MultiPrinter	LA70 Personal Printer	LA75 Plus Companion Printer	LA210
Technology	Dot-matrix, 24-wire	Dot-matrix, 9-wire	Dot-matrix, 24-wire	Dot-matrix, 9-wire
Speed	400 ch/s draft 133 ch/s LQ	200 ch/s draft 100 ch/s memo 40 ch/s NLQ	250 ch/s draft 83 ch/s LQ	240 ch/s draft 80 ch/s memo 40 ch/s NLQ
Recommended impressions/month (maximum)	6,000	1,000	2,000	3,000
Number of colors	8	1	4	1
Paper type	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold; labels; envelopes	Cutsheet; fanfold, labels
Paper thickness (maximum)	0.020 in. (0.052 cm)	0.012 in. (0.031 cm)	0.012 in. (0.031 cm)	0.015 in. (0.038 cm)
Multipart forms	1–6	1–3	1–4	1–4
Width of output	4–17 in. (10.2–40.6 cm)	4.5–10 in. (11.4–15.5 cm)	4.5–10 in. (11.4–15.5 cm)	3.5–14.9 in. (8.9–37.9 cm)
Resident fonts	2	1	1	2
OCR-A/B	OCR-A/B	N/A	OCR-A/B	N/A
Characters per inch	5, 6, 6.7, 8.55, 9, 10, 12, 13.33, 17.14, 18	5, 6, 6.6, 8.25, 8.55, 9, 10, 12, 13.2, 16.5, 17.1, 18	10, 12, 16.5, 17.5	5, 6, 6.8, 8.25, 10, 12, 13.2, 16.5
Lines per inch	2, 3, 4, 6, 8, 12	2, 3, 4, 6, 8, 12	2, 3, 4, 6, 8, 12	2, 3, 4, 6, 8, 12
Graphics protocols	ANSI/Sixel IBM ProPrinter	ANSI/(PPL2) IBM ProPrinter	ANSI/Sixel IBM ProPrinter	ANSI/Sixel IBM Graphics 5
Resolution (dots per inch)	360 H × 180 V (ANSI mode); 180 H × 180 V (IBM ProPrinter mode)	180 H × 180 V	360 H × 180 V	132 H × 72 V
Bar codes	Yes, 3 of 9 and ON-TAP software	Yes, through optional ON-TAP software	Built-in 3 of 9 and optional ON-TAP software	Yes, through optional ON-TAP software
Interfaces	EIA-423,[2] parallel[3] 20 mA8	EIA-423,[2] parallel[3]	EIA-423 (MMJ) Centronics Parallel	EIA-232 6, parallel optional
IBM PC-compatible	Yes (IBM ProPrinter XL24 emulation)	Yes (IBM ProPrinter XL24 emulation)	Yes (IBM ProPrinter emulation)	Yes (IBM graphics printer emulation optional)
Baud rate	200–19,200	200–9,600	110–9,600	50–9,600
Buffer size	8 KB	2 KB	8 KB	2 KB
Noise level	<55 dBa <53 dBa quiet mode	<55 dBa	52 dBa	58 dBa
Dimensions W × D × H	24.2 × 12.2 × 6.7 in. 61.5 × 31 × 17 cm	15.5 × 11.4 × 4.7 in. 39.3 × 29 × 12 cm	16.8 × 14.5 × 5.3 in. 42.7 × 34.5 × 12.1 cm	21.2 × 13.5 × 5 in. 54.6 × 34.3 × 12.1 cm
Weight	31.5 lb (14.3 kg)	16 lb (7.5 kg)	10.5 lb (4.8 kg)	27 lb (121 kg)
Ribbon/ink technology	Black and color cartridges	Nylon cartridge	Nylon cartridge optional color	Nylon cartridge

[1] Data Products type: LLF01 optional.
[2] EIA-232D compatible with optional adapter.
[3] PC Centronics type.
[4] EIA-423 compatible.

PrintServer Family

Overview

Digital's PrintServer systems are connected directly to Ethernet and support the PostScript page description language by Adobe Systems Inc.

The PrintServer systems enable any user on an Ethernet network to print text, graphics, halftones, and scanned images at 300-dots-per-inch resolution. Maximum print speeds are 20 pages per minute on the *turbo* PrintServer 20, and 40 pages per minute on the PrintServer 40 *Plus.* PrintServer systems support the VMS, ULTRIX, and UNIX (Berkeley-based or System V with access to Berkeley Library Extensions) operating systems. DOS systems are supported through PATHWORKS software. Apple Macintosh systems are supported through PATHWORKS for Macintosh software as well as third-party hardware and software.

Digital's PrintServer family offers paper-handling features that provide greater productivity and user satisfaction. With the PrintServer family's large paper capacity, workgroups can print many documents without reloading paper. Output is collated facedown, for convenience.

The right paper combination for jobs can be obtained by loading the input trays with up to three different paper sizes. The PrintServer software provides for dynamic paper tray selection during print jobs. The PrintServer systems have two user-selectable output trays.

The PrintServer family can print on a variety of paper and forms—including specified label stock and transparencies. For special media, where a straight paper path is required, a side output tray is provided.

PrintServer systems bring sophisticated printing capabilities to a wide variety of users. Because they are shared through an Ethernet network, the PrintServer systems provide PostScript printing at a low cost per user. And because the PrintServer systems support a variety of operating systems, they can satisfy printing needs regardless of the desktop device that is used.

Features

- Connects directly to standard Ethernet networks (thick wire and twisted pair), supporting both DECnet/OSI and TCP/IP environments
- Supports DECconnect ThinWire networks with optional ThinWire Ethernet Station Adapter (DESTA)
- Full support for DECnet and TCP/IP printing coexists in a single PrintServer; no need for a dedicated printer for each protocol
- Printing support for VMS, ULTRIX, and Berkeley-based UNIX systems on Ethernet networks
- PATHWORKS for VMS or PATHWORKS for ULTRIX software is required to print from DOS systems
- PATHWORKS for Macintosh software is required to print from Apple Macintosh systems; third-party hardware and software solutions are also available: Mac connection using Cayman Systems, Inc. Gator Box or Shiva Fastpath to link AppleTalk to Ethernet; software from Alisa Systems, Inc., or Pacer software installed on VMS network host (Cayman Systems, Inc., 617-494-1999; Shiva Corp., 800-458-3535; Alisa Systems, Inc., 818-792-9474; Pacer Software, Inc., 619-454-0565)
- Employs the PostScript page description language from Adobe Systems Inc. with 29 resident PostScript typefaces; optional typefaces for VMS clients also available. See product descriptions for DECfonts Typeface Collection and SoftFont at the end of this chapter.
- Software translators enable printing of ANSI/Sixel, ReGIS, PCL (VMS only), and Tektronix 4010/4014 files; ASCII text only (UNIX/TCP/IP)
- Access control software allows a system manager to have full control over who may have access to the PrintServer

Overview *(Continued)*

- Quiet enough to blend in with today's open office settings
- Provides near-typeset print quality with 300-dots-per-inch resolution
- Capability to print multiple page images on a single side of paper with the "number-up" function
- Per-job accounting functions allow system manager to monitor all access of a PrintServer and bill for printer usage
- Provides generous input and output capacity, and collated, facedown output
- Handles a variety of international paper sizes; supports predrilled paper, transparencies, and specified label stock

If the VMS, ULTRIX, UNIX, MS-DOS, or Apple Macintosh operating systems are used, the PrintServer family offers complete solutions for printing environments with moderate to heavy print volumes. The PrintServer family supports Digital's Network Application Support (NAS), enabling many types of systems to share printing facilities via DECnet or TCP/IP Ethernet networks.

PrintServer systems are ideal for department managers and information systems professionals who want the benefits of distributed network printing. The PrintServer family can satisfy a wide assortment of printing needs. In a single environment, administrative, accounting, and document-creation activities can go on simultaneously. Many users can share the same printer while using different applications—printing multiple formats on various sizes and types of media.

A key to the PrintServer family's versatile printing performance is PostScript, the page description language, from Adobe Systems Inc., now a de facto standard in printer software. PostScript enables users to print text, graphics, halftones, and scanned images on the same page. PostScript includes 29 resident typefaces (listed in the PrintServer Specifications section in this chapter). All 29 typefaces are accessible to all PostScript applications. The 29 typefaces are not accessible to print jobs accessed through translators.

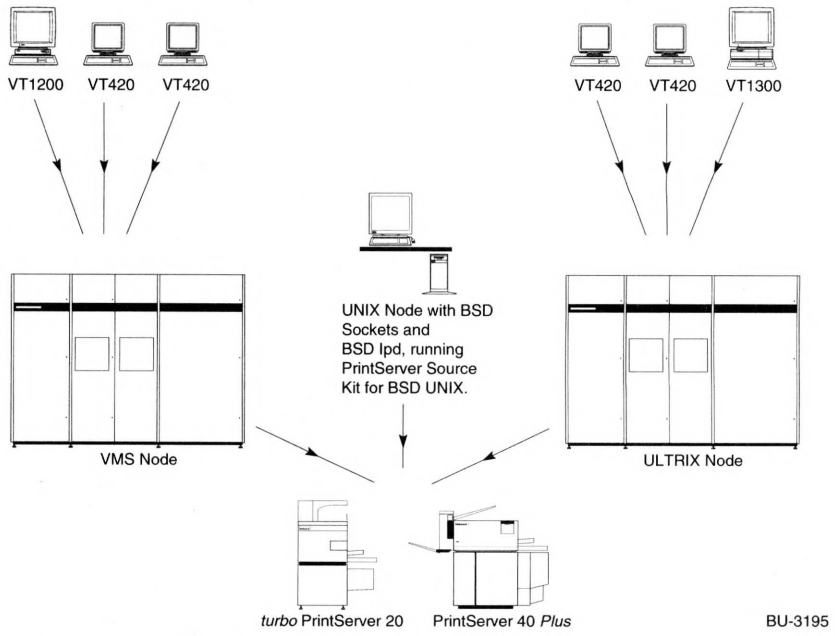
Equipped with the PostScript language, PrintServer systems can produce professional, complex documents, with multiple typefaces in a variety of sizes, weights, and styles, as well as rotated type, textures and patterns, halftones, and other images, in any size or shape. With the appropriate application software, the PostScript language can help eliminate the trouble and expense of dealing with outside vendors for conventional typesetting, paste-up, and printing tasks.

Because the PostScript language is device-independent, files can be printed on any PrintServer system, DEClaser printer, high-resolution typesetting system, and other printing devices that support the PostScript language.

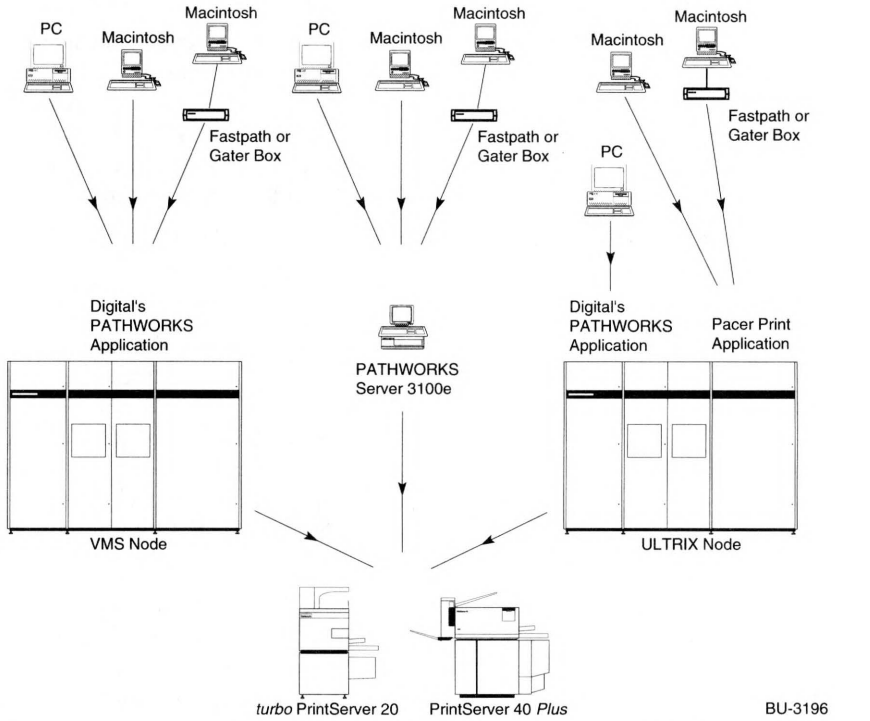
Many applications supported by Digital take advantage of the power of the PostScript language. These include DECpage (supports simplex printing only at this time), VAX DOCUMENT, DECwrite (Digital's DECwindows-based compound document editor), DECpresent, and many CAD/CAM/CAE packages. Other applications written for the DECwindows operating environment also support the PostScript language, as well as third-party applications such as Technical Publishing Software (TPS) by Interleaf, Inc., Pager by Datalogics, Inc., PageMaker by Aldus, Inc., and Scribe by UNILOGIC, Ltd.

The unique advantage of Digital's network printing solution is that the PrintServer family can be shared across heterogeneous platforms (as shown in the following diagrams). A diverse set of users working with different operating systems from different hardware platforms can share and print information without worrying about these differences—working as one across the Ethernet. VMS and ULTRIX systems, and UNIX systems that support BSD TCP/IP sockets, can coexist and share resources and information easily as these four diagrams indicate.

Overview *(Continued)*

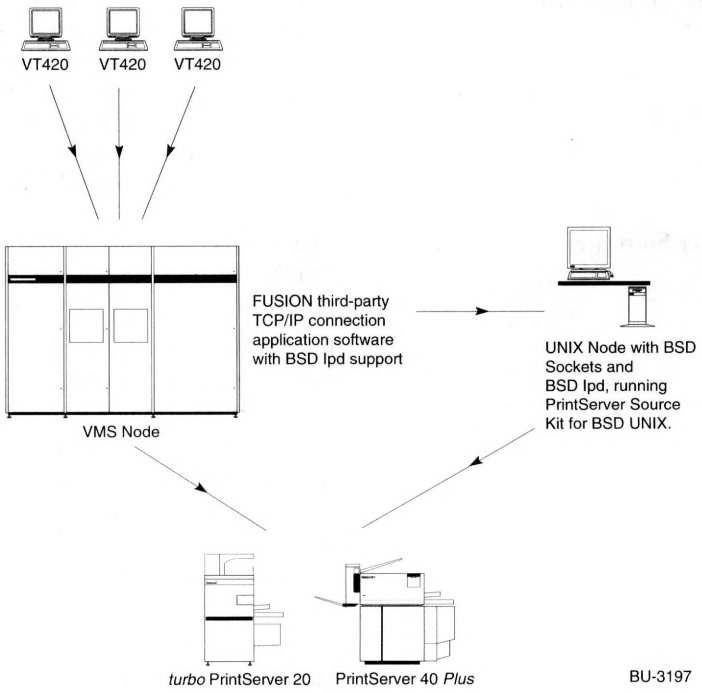


The printing environment for mixed operating systems: VMS, ULTRIX, and UNIX systems that support BSD TCP/IP sockets. For direct printing from all systems in a mixed operating environment, like the one shown in the diagram, the supporting host can be either a VMS system or an ULTRIX system. With Digital's PrintServer Supporting Host software for VMS Version 4.0, and the appropriate Client software configured on each of the VMS and ULTRIX systems, and with the PrintServer Source Kit for BSD UNIX installed on at least one of the UNIX systems, all can print directly to the PrintServer systems.

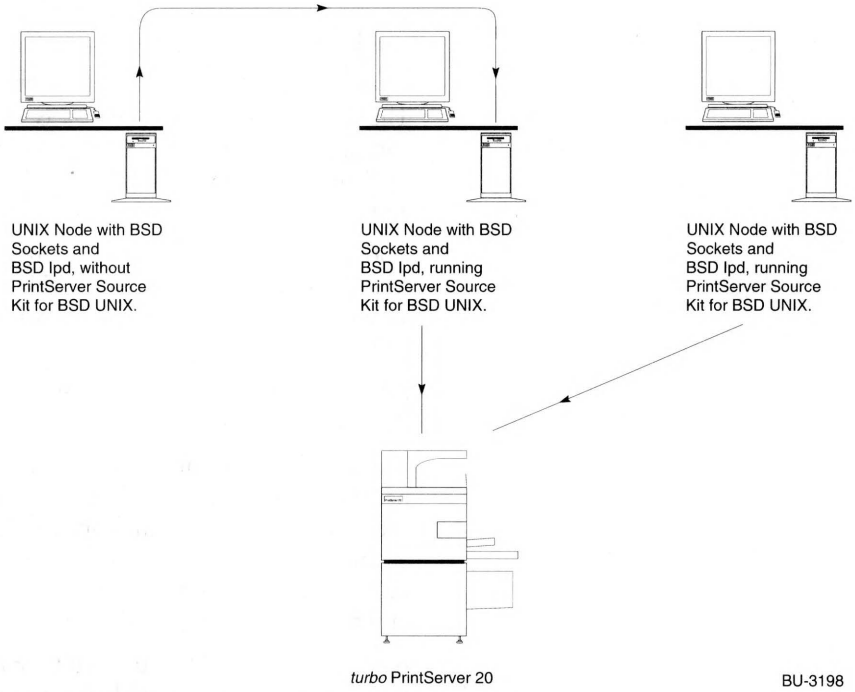


The printing environment for PC and Macintosh integration with PATHWORKS. The combination of DECprint, PrintServer, and PATHWORKS software products provides seamless integration. Any VMS or ULTRIX system on the Ethernet can run the PrintServer Supporting Host software. For PC integration with VMS, the system running PATHWORKS for VMS requires DECprint Printing Services or VAX PrintServer Client software V3.0. With PCs and ULTRIX, the system running PATHWORKS for ULTRIX requires PrintServer Client software for ULTRIX or ULTRIX V4.0 or greater. The PC system requires PATHWORKS for DOS or PATHWORKS for OS/2. PATHWORKS for Macintosh is required for Macintosh integration.

Overview *(Continued)*



The printing environment for VMS and non-Digital UNIX systems. In a mixed VMS and UNIX environment as shown in the diagram, it is recommended that the supporting host be a VMS system. This configuration allows direct printing from both VMS and UNIX systems that support BSD TCP/IP sockets. At least one BSD-UNIX client system must have the PrintServer Source Kit for BSD UNIX installed. In a TCP/IP-only environment, VMS systems may spool through a UNIX node using FUSION, a third-party layered software product. In that case the supporting host and client would be the UNIX system, and only the *turbo* PrintServer 20 can be supported.



The printing environment for non-Digital UNIX systems only. In an environment comprised solely of UNIX systems supporting BSD TCP/IP sockets, as in the example shown, the *turbo* PrintServer 20 is supported. (The PrintServer 40 *Plus* is not supported in this environment.) Any one of these systems may be designated as the supporting host and at least one system must be designated as a client. The PrintServer Source Kit for BSD UNIX must be installed on these designated systems. (The source license agreement must be signed prior to delivery. Installing and porting the source code requires proficiency with the C programming language.)

Overview *(Continued)*

The printing environment for ULTRIX and non-Digital UNIX systems. Another common environment (not shown) is one which consists of only ULTRIX and non-Digital UNIX systems. In this case it's recommended that the PrintServer Supporting Host and Client software reside on the ULTRIX node. With Digital's PrintServer Source Kit for BSD UNIX installed on UNIX systems, UNIX systems that support BSD TCP/IP sockets can print directly to the PrintServer family. (For details on the PrintServer Source Kit for BSD UNIX, refer to SPD 38.53.)

PrintServer Software

The PrintServer system's intelligence resides in the software. New releases of PrintServer software give additional functions while protecting hardware investments.

PrintServer software handles all of the print management functions, and provides the communication between a computer system with a print job and the PrintServer system. PrintServer software consists of two portions: *supporting host* and *client*.

One system on the network is designated as the *supporting host*. The *supporting host* loads the PrintServer software into the PrintServer controller via the network, and performs management functions such as accounting for the PrintServer. Any system that sends print jobs directly to the PrintServer system is known as a *client*.

The newest release of PrintServer software adds capabilities to the Supporting Host component. Common host services give both VMS systems and UNIX platforms that support BSD TCP/IP sockets direct access to the PrintServer system. BSD-based UNIX systems no longer need to spool print jobs through and ULTRIX node. This promotes a high degree of compatibility across operating systems and network protocols.

Significant enhancements have been added to the management functions of the Supporting Host software as well. For example, the PrintServer software's accounting utility prepares usage reports on a per-user basis and provides the system manager with a convenient way to monitor all access of the PrintServer and bill accordingly for its usage. Centralized accounting information (on a per-job basis) can be sent to any supporting host system on the network.

The PrintServer's Print Client Access utility provides the system manager with a convenient way to control all access to a PrintServer system. Access is controlled by "allowing" or "denying" access by either system name or by its network address.

Another improvement is a patented image rendering technology—DECimage—which enhances printed images with crisper edges, finer details and greater overall quality without additional hardware through superior halftoning capabilities. DECimage is supported under the ULTRIX and VMS operating systems.

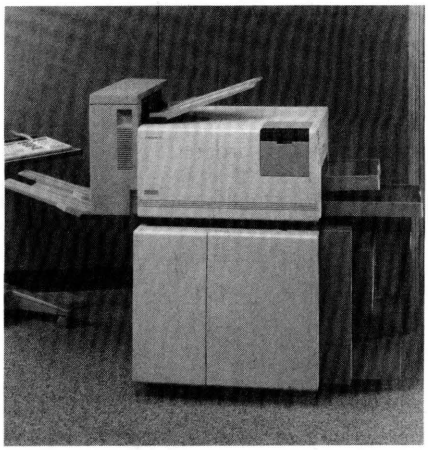
All of these enhancements add up to a rich printing system with tremendous flexibility for users and for system managers.

The PrintServer family delivers a patented innovative feature known as "number-up" (n-up), which enables users to print multiple page images per side of a sheet of paper. N-up significantly reduces paper consumption and saves time by enabling users to preview entire document layouts on a single sheet. N-up also increases the effective throughput of the printer so print jobs are completed faster.

N-up is accessible from the print command level or through supporting applications and gives users complete control over borders, margins, margin alternations, pages per sheet, first page, page order, and grid.

For Pre-sales assistance, in the U.S., call the Technical Consulting Center, 800-343-4040 or 603-884-4040.

PrintServer 40 *Plus*



The PrintServer 40 *Plus* system features a high-performance CMOS-based MicroVAX CPU for processor-intensive print jobs such as complex graphics and multifont text. It can print up to 40 pages per minute and print volumes of up to 100,000 pages per month.

The PrintServer 40 *Plus* system is designed for user convenience. It includes a Digital VT320 video terminal as a console device from which users can monitor printer status, active print job characteristics, printer/job defaults, and other important information. The VT320 console can also provide detailed diagnostic data for field service professionals.

Standard operating messages such as "paper out" are indicated on the VT320 console, while the control panel located on the printer itself communicates messages graphically to the user.

Features

- High throughput of processor-intensive print jobs with high-performance CMOS-based MicroVAX CPU
- Provides up to 40 page-per-minute printing
- Supports print volumes of up to 100,000 pages per month
- Large capacity (2000 sheet) input tray; two auxiliary input trays (250 sheets each); two output trays (500 sheets each); optional large capacity output tray (3000 sheets) for unattended operation
- Includes a Digital VT320 video terminal console to monitor system, print job status
- Paper handling includes 11 paper sizes (up to 11 × 17), transparencies, and labels

Ordering Information

PrintServers are network printers consisting of hardware and appropriate software licenses (DECnet, TCP/IP, DECprint Printing Services for VMS) necessary for network use (software licenses are packaged with the hardware). Software media, H4005 Ethernet transceiver, DELNI or DESTA, and the transceiver or ThinWire cable to connect the PrintServer to the network must be ordered separately.

Upgrade Kit

LPS40-UA PrintServer 40-to-PrintServer 40 *Plus* Upgrade Kit

Model Number	Country or Region	Language
LPS40-xA	U.S., Canada, Mexico, South America	English, French, Spanish
LPS40-x3	Austria, New Zealand, Belgium, Canada, Denmark, Finland, France, Holland, Israel, Italy, Japan, Norway, Portugal, Spain, Sweden, Switzerland, U.K., Ireland, Germany, Austria	English, Flemish, French, Danish, Finnish, Dutch, Hebrew, Italian, Norwegian, Portuguese, Spanish, Swedish, German

Note: Replace x with D for DECnet license; F for TCP/IP license

Ethernet Connectivity

H4005	Ethernet Transceiver
DELNI-BA	U.S./Canada version Local Network Interconnect
DESTA-BA	ThinWire Ethernet Station Adapter

For **H4005/DELNI** connection, right-angle cables must be ordered:

BNE3K-xx	AUI PVC-jacketed right-angle male-to-female transceiver cable; choose required length: 10, 20, or 40 meters (10 m = 32.8 ft, 20 m = 65.6 ft, 40 m = 131.2 ft)
BNE3M-xx	AUI Teflon-jacketed right-angle male-to-female transceiver cable; choose required length: 5, 10, 20, or 40 meters (5 m = 16.4 ft, 10 m = 32.8 ft, 20 m = 65.6 ft, 40 m = 131.2 ft)

Note: For more information on Ethernet connectivity options and international versions of DESTA and DELNI, refer to Chapter 6, *Networks, Communications, and Cables.*

Accessories and Supplies

For more information, refer to the *DECdirect* catalog.

LN01X-AB	A size paper, 8.5 by 11.0 in., 5000 sheets (letter)
LN03X-AJ	A size transparencies, 8.5 by 11.0 in., 50 sheets
LPSXX-PA	B size paper, 11.0 by 17.0 in., 2500 sheets
LPS4X-BA	Small paper cassette
LPS4X-BB	Large paper cassette
H9850-TA	Laser labels (21/sheet, 100/box)
H9850-TB	Laser labels (30/sheet, 100/box)
LPS4X-AA	Toner kit (approximately 60K pages)
LPS4X-AB	Maintenance kit (approximately 100K pages)
LPS4X-AC	Fuser oil kit (approximately 60K pages)
LPS4X-CA	Large capacity output tray (3000 sheets)
LPS4X-LP	Bulk supplies kit

Software

QA-YNCAA-Hx	DECprint Printing Services for VMS*
QA-797AA-Hx	VAX PrintServer Client Software†
QA-798AA-Hx	DEC PrintServer Supporting Host Software for VMS
QA-VVMAA-Hx	PrintServer Client Software for ULTRIX‡
QA-VVZAA-Hx	DEC PrintServer Supporting Host Software for ULTRIX
QB-YURAA-E5	PrintServer source kit for BSD UNIX V4.0, includes license, media (TK50), and documentation
QB-YURAA-EM	PrintServer source kit for BSD UNIX V4.0, includes license, media (magtape), and documentation
QB-YURAA-E8	PrintServer source kit for BSD UNIX V4.0, includes license, media (CD-ROM), and documentation
QB-YURAA-E9	PrintServer source kit for BSD UNIX V4.0, includes license, media (QIC24), and documentation
QB-YURAA-GZ	PrintServer source kit for BSD UNIX documentation

* Required only with VMS operating system V5.3 or greater.

† Required only with VMS operating system less than V5.3.

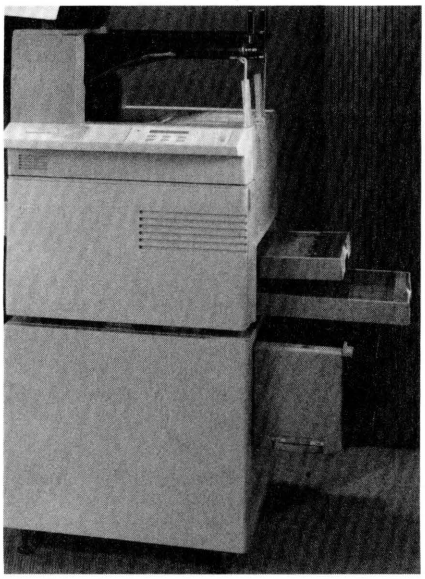
‡ Required only with ULTRIX operating system less than V4.0; ULTRIX operating system V4.0 and higher includes the client software.

Note: x denotes media type: 5 = TK50; M = magtape

Specifications

PrintServer 40 *Plus* specifications follow *turbo* PrintServer 20 ordering information.

turbo PrintServer 20



As the name implies the *turbo* PrintServer 20 has a supercharged controller that utilizes a high-performance CPU-on-a-chip. It offers greatly enhanced performance in processor-intensive print jobs such as complex graphics and multifont text. It is fast enough for the requirements of a large workgroup or a small department. It will handle moderate print volumes of up to 70,000 pages per month.

A distinguishing characteristic of the *turbo* PrintServer 20 system is its duplex (two-sided) printing capability. The *turbo* PrintServer 20 system processes page images using an interleaved technique that enables users to print multiple-page, two-sided documents quickly and efficiently. Designed as a standard feature, duplex printing can cut paper costs, and reduce production and distribution costs.

The *turbo* PrintServer 20 system was designed for user convenience. This convenience starts with hardware installation which typically can be completed in less than an hour. (Optional installation is available from Digital Service.) Software should be installed by the network manager familiar with VMS, ULTRIX, or UNIX software installation procedures.

The *turbo* PrintServer 20 system includes an integral Liquid Crystal Display (LCD) control panel. The LCD displays up to 48 characters of user-friendly, local-language text to keep users informed of the printer status. An easy-to-read graphic display also provides printer status. With the touch of a button, users can conveniently monitor active print job characteristics, printer/job defaults, and paper and supplies status.

The *turbo* PrintServer 20 system's modular design makes for speedy and straightforward user-care and reliable operation. The slideout drawer puts user-replaceable consumables within easy reach.

Features

- Can be used in a UNIX-only environment without any other Digital hardware
- Performs user-selectable duplex (two-sided) and simplex (single-sided) printing
- Provides up to 20 page-per-minute printing
- Provides large capacity (1000 sheet) input tray; two auxiliary (250 sheets each) input trays; two (750 sheets each) selectable output trays
- Integral control panel indicates printer and print job status
- Provides offset stacking, so print jobs can be instantly separated
- Non-Digital systems running a UNIX operating system or a System V operating system with access to Berkeley Library Extensions require the PrintServer Source Kit for BSD UNIX; to port the source code, a technical user proficient with source code porting is required.
- Simple user care to provide optimal printer performance and availability
- Videotape included with system—a popular training tool on use and care of the *turbo* PrintServer 20

Ordering Information

PrintServers are network printers consisting of hardware and appropriate software licenses (DECnet, TCP/IP, DECprint Printing Services for VMS) necessary for network use (software licenses are packaged with the hardware). Software media, H4005 Ethernet transceiver, DELNI or DESTA, and the transceiver or ThinWire cable to connect the PrintServer to the network must be ordered separately.

Model Number	Country or Region	Language
LPS20-GA	U.S., Canada, Mexico, South America, Sweden	English, Spanish, Portuguese, Swedish
LPS20-GZ	Australia, New Zealand	English
LPS20-GB	Belgium, Switzerland	Flemish, French, German, English
LPS20-GD	Denmark	Danish
LPS20-IC	Finland, Norway, Portugal,Spain	Finnish, Norwegian, Portuguese, Spanish
LPS20-GP	France	French
LPS20-GH	Holland	Dutch
LPS20-GT	Israel	Hebrew
LPS20-GI	Italy	Italian
LPS20-GE	U.K., Ireland	English
LPS20-GG	Germany, Austria	German
LPS20-UA	LPS20 to *turbo* LPS20 upgrade kit for North America	

Ethernet Connectivity

H4005	Ethernet Transceiver
DELNI-BA	U.S./Canada version Local Network Interconnect
DESTA-BA	ThinWire Ethernet Station Adapter

For **H4005/DELNI** connection, right-angle cables must be ordered:

BNE3K-xx	AUI PVC-jacketed right-angle male-to-female transceiver cable; choose required length: 10, 20, or 40 meters (10 m = 32.8 ft, 20 m = 65.6 ft, 40 m = 131.2 ft)
BNE3M-xx	AUI Teflon-jacketed right-angle male-to-female transceiver cable; choose required length: 5, 10, 20, or 40 meters (5 m = 16.4 ft, 10 m = 32.8 ft, 20 m = 65.6 ft, 40 m = 131.2 ft)

Note: For more information on Ethernet connectivity options and international versions of DESTA and DELNI, refer to Chapter 6, *Networks Communications, and Cables*.

Accessories and Supplies

For more information, refer to the *DECdirect* catalog.

LN01X-AB	A size paper, 8.5 in. by 11.0 in., 5000 sheets (letter)
LN03X-AJ	A size transparencies, 8.5 in. by 11.0 in., 50 sheets
LPSXX-PA	B size paper, 11.0 in. by 17.0 in., 2500 sheets
LPS4X-BA	Small paper cassette
LPS4X-BB	Large paper cassette
H9850-TA	Laser labels (21/sheet, 100/box)
H9850-TB	Laser labels (30/sheet, 100/box)
LPS2X-AA	Toner kit (approximately 20K pages)
LPS2X-AD	Cleaning units kit (order when toner kit ordered, LPS2X-AA, or at approximately 40K pages)
LPS2X-AB	Supplies kit (approximately 20K pages)
LPS2X-AC	OPC drum kit (approximately 80K pages)
LPS2X-LP	80,000-page bulk supplies kit

Page limits are for simplex printing only.

Software

QA-YNCAA-Hx	DECprint Printing Services for VMS*
QA-797AA-Hx	DEC PrintServer Client Software†
QA-798AA-Hx	DEC PrintServer Supporting Host Software for VMS
QA-VVMAA-Hx	PrintServer TCP/IP Client Software for ULTRIX‡
QA-VVZAA-Hx	DEC PrintServer Supporting Host Software for ULTRIX
QB-YURAA-E5	PrintServer source kit for BSD UNIX V4.0, includes license, media (TK50), and documentation
QB-YURAA-EM	PrintServer source kit for BSD UNIX V4.0, includes license, media (magtape), and documentation
QB-YURAA-E8	PrintServer source kit for BSD UNIX V4.0, includes license, media (CD-ROM), and documentation
QB-YURAA-E9	PrintServer source kit for BSD UNIX V4.0, includes license, media (QIC24), and documentation
QB-YURAA-GZ	PrintServer source kit for BSD UNIX documentation

* Required only with VMS operating system V5.3 or later.

† Required only with VMS operating system less than V5.3.

‡ Required only with ULTRIX operating system less than V4.0; ULTRIX operating system V4.0 or later includes the client software.

Note: x Denotes media type: 5 = TK50; M = magtape.

PrintServer 40 *Plus* and *turbo* PrintServer 20 Specifications

Specifications

Product Type

Nonimpact printers with Digital-developed data controllers, Ethernet interface, PostScript interpreter by Adobe Systems, Inc., PrintServer 40 *Plus* includes VT320 console terminal

Prerequisite Software

DECnet/OSI Phase IV or TCP/IP
VMS systems: VMS V5.3 (or greater)
ULTRIX V4.0

PrintServer Software

PrintServer 40 *Plus* and *turbo* PrintServer 20
In an environment that comprises only VMS systems, or any combination of VMS, ULTRIX and UNIX systems:

- Designate either a VMS system or ULTRIX-DECnet system as the *supporting host*; install QA-798AA-Hx or QA-VVZAA-Hx on it.
- Install QA-797AA-Hx on each VMS V5.2 or earlier system designated as a *client,* and QA-YNCAA-Hx on each VMS V5.3 or later system.
- For VMS V5.3 or later, DECprint Printing Services for VMS is recommended for client systems.
- Install QA-VVMAA-Hx on each ULTRIX system designated as a *client*; systems running ULTRIX operating system V4.0 or greater do not require client software. UNIX client systems are to install QB-YURAA-Ex.

In an environment that comprises only ULTRIX systems, or any combination of ULTRIX and UNIX systems (Berkeley-based or System V with access to Berkeley Library Extensions):

- Designate an ULTRIX system as the *supporting host* and install QA-VVZAA-Hx. For a *turbo* PrintServer 20 operating in a combined ULTRIX and UNIX environment, a UNIX system can be designated as the supporting host by installing and porting QB-YURAA-Ex.
- Install QA-VVMAA-Hx on each ULTRIX system designated as a *client*. Systems running ULTRIX operating system V4.0 or greater do not require client software.
- Install and port QB-YURAA-Ex on each UNIX system (Berkeley-based or System V with access to Berkeley Library Extensions) designated as a *client*. UNIX users can also spool through the ULTRIX supporting host system; (does not require the source code).

***turbo* PrintServer 20 only**
In an environment that comprises only Berkeley-based UNIX systems (Berkeley-based or System V with access to Berkeley Library Extensions):

- Designate one UNIX system as the *supporting host* and install and port QB-YURAA-Ex.
- Install and port QB-YURAA-Ex on each system designated as a *client*.

Maximum Print Speed*

PrintServer 40 *Plus:*

– 40 pages-per-minute with 8.5- × 11-inch or A4 paper
– 24 pages-per-minute with 8.5- × 14-inch paper
– 20 pages-per-minute with 11- × 17-inch or A3 paper

***turbo* PrintServer 20:**

– 20 pages-per-minute with 8.5- × 11-inch or A4 paper, simplex
– 16 printed sides-per-minute with 8.5- × 11-inch or A4 paper, duplex
– 11 pages-per-minute with 11- × 17-inch or A3 paper, simplex
– 13 pages-per-minute with 8.5- × 14-inch paper, simplex

* Print speed is a function that is dependent on several characteristics: paper size, amount of text and number of font changes, quality of application-generated PostScript code, and graphics complexities.

PrintServer 40 *Plus* and *turbo* PrintServer 20 Specifications

Specifications *(Continued)*

Image Resolution

300 × 300 dpi for text, graphics, and images

Paper Handling

	PrintServer 40 *Plus*	*turbo* PrintServer 20
Three cutsheet input trays: total sheet capacity of 20 lb (75 g/m^2) paper	2500	1500
Primary input tray	2000	1000
Two primary cutsheet output trays: total sheet capacity of 20 lb (75 g/m^2) paper	1000	1500
Large capacity output tray (optional)	3000	–

Side output tray for media such as transparencies and specified label stock; PrintServer 40 *Plus:* user-selectable faceup or facedown; *turbo* PrintServer 20: output is faceup.

Paper

PrintServer 40 *Plus* 16 lb (60 g/m^2) minimum; 24 lb (90 g/m^2) maximum
***turbo* PrintServer 20** 18 lb (67.5 g/m^2) minimum; 24 lb (90 g/m^2) maximum*

* Minimum 20 lb (75 g/m^2) paper weight is recommended for duplex printing to ensure maximum readability and paper feeding reliability. Predrilled paper is supported.

Recommended Moisture Content

4%–6%

Environmental Requirements

For maximum print quality and paper feeding reliability, paper should be stored, unopened, in the same environment as the printer for at least 24 hours before use.

Transparencies

Polyester film with a basic thickness 0.004 inch (± 0.0004 inch) with both sides coated to receive toner

Label stock

As specified by label manufacturers for laser printers and plain paper copiers

Typefaces (built in)

Courier (fixed pitch) with bold, oblique, and bold oblique
Times with bold, italic, and bold italic
Helvetica with bold, oblique, and bold oblique
Symbol/Math
ITC Avant Garde Gothic Book with Book oblique, demi, and demi-oblique
New Century Schoolbook with bold, italic, and bold italic
ITC Lubalin Graph Book with Book oblique, demi, and demi-oblique
ITC Souvenir demi, demi italic, light, and light italic

Optional Typefaces

SoftFont is a series of bitmap fonts emulating the same font families and sizes as the LN03 and DEClaser 2100 plus/2200 plus printers. Any member of Digital's PrintServer family that operates under DECprint Printing Services software V4.0 or higher can use SoftFont.

DECfonts Typeface Collection is a set of PostScript Type 1 font kits that can be used on any Digital networked PostScript printer with applications such as DECwrite and DECpresent.

See SoftFont and DECfonts Typeface Collection product descriptions at the end of this chapter.

Font Cache	256 Kbytes RAM
PostScript Virtual Memory (VM)	1 Mbyte

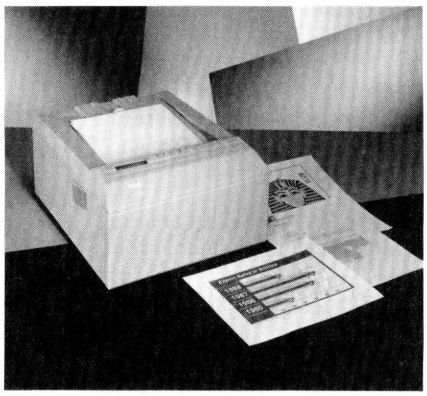
* DECfonts is available for VMS and ULTRIX. It includes the Typeface Pack I fonts.

PrintServer 40 *Plus* and *turbo* PrintServer 20 Specifications

Specifications *(Continued)*

		PrintServer 40 *Plus*	*turbo* PrintServer 20
Physical Characteristics	Height	102.7 cm (40.4 in.)	126 cm (49.6 in.)
	Width	152.4 cm (60 in.)	93.5 cm (36.8 in.)
	Depth	72.1 cm (28.4 in.)	69 cm (27.2 in.)
	Weight	220 kg (485 lb)	157 kg (345 lb)
Power Requirements	Voltage	200/208/240 V; 60 Hz	100–120 V; 50–60 Hz (North America and Japan)
		200/220/230/240 V; 50 Hz	220–240 V; 50 Hz (International)
	Current ac amps (maximum)	12 A	12 A (North America and Japan) 7 A (International)
	Heat dissipation (continuous printing)	<6000 Btu/hr	<3585 Btu/hr
Operating Environment	Temperature	15° to 32° C (59° to 90° F)	10° to 32° C (50 ° to 90° F)
	Relative humidity	Operating: 20% to 80% humidity (noncondensing)	
	Recommended humidity	45% ± 10%	
	Altitude	Up to 2000 meters (6500 feet)	

DECLaser 1000 (LN07) Family



DECLaser 1000 printers are available in two models. Both models print up to four pages per minute. The DECLaser 1100 supports the DEC ANSI/sixel protocol. PostScript support is available through an optional upgrade kit. The DECLaser 1150 provides both DEC ANSI/sixel and PostScript support as a standard feature.

Serial and parallel (IBM/Centronics) interfaces allow the DECLaser 1000 to be connected to any of Digital's terminals, workstations, or DECstation PCs. HP PCL-4 for HP II P emulation is included in the DECLaser 1150. HP PCL-4 for II P and IBM ProPrinter X24 is available as a cartridge for the DECLaser 1100.

Both versions of the DECLaser 1000 printers print on standard, legal, and international paper sizes as well as envelopes, transparencies, and labels. Optional font cartridges are installed under the paper trays in the front of the DECLaser printers. Maintenance is simple with a single supplies cartridge.

The DECLaser 1150 printer supports DEC ANSI/sixel and PostScript. PostScript by Adobe Systems Inc. is the industry-standard page description language offering flexibility and device independence. With the availability of PostScript, multiple type styles can be integrated with graphics; images can be rotated, enlarged, or reduced; and line art, text, and digitized photographs can be used within one document.

With PostScript support, full compatibility with VMS-based PostScript applications is provided. Forty-three PostScript-resident fonts are included with the DECLaser 1150. These fonts are used in Digital and industry-standard applications. With Apple LaserWriter compatibility, users have access to PC, UNIX, and ULTRIX applications, written to support the Apple LaserWriter.

The "U" version of the DECLaser 1150 is ideal for printing in a non-VMS environment. This version contains all the features of the basic DECLaser 1100 plus the industry-standard Adobe PostScript and HP PCL emulation. In addition, with DECLaser PostScript printers, thousands of applications written to support PCs, UNIX, and ULTRIX operating systems can be accessed.

For VMS PostScript printing, DECprint Printing Services for VMS is a layered product required by VMS systems to access and control the DECLaser 1150 ("R" version) PostScript printer. It contains the print command interpreters and translators required to print documents formatted in a number of industry-standard or proprietary protocols (ASCII, ANSI/LN03, PostScript, DDIF, Tektronix 4010/4014, HP LaserJet II P, and Apple LaserWriter). It must be installed on each VMS V5.3 or higher CPU or a single CPU within a cluster that will be sending print jobs to a Digital PostScript printer. This provides a single client interface to drive all VMS-based printing for Digital PostScript printers. Utilization of this software product allows DECLaser PostScript printers to provide better support for a wide variety of host environments than any other printers available. With the addition of this software, compatibility is provided for Macintosh through PATHWORKS for Macintosh and PC applications are accessible through software translators for HP LaserJet II P (PCL-4).

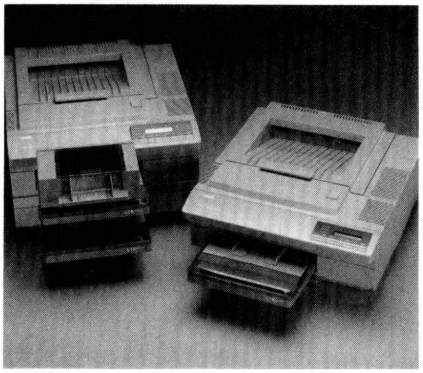
Features

- Prints up to four pages per minute at 300- by 300-dot-per-inch resolution
- Equipped with standard EIA-232 serial and parallel (IBM/Centronics) interfaces, and includes DECconnect adapter and cable
- Wide variety of optional font cartridges (credit-card sized)
- Optional memory upgrade cards (graphic applications may require additional memory)

DECLaser 1000 Family
(Continued)

- Optional lower cassette (250 sheets) for increased capacity
- Easy-to-read LCD (liquid crystal display) displays printer's operational status, font selection, paper selection, and baud rate
- Optional font cartridges including bar codes
- Optional software (see product descriptions at the end of this chapter): DECprint Utility software (DECLaser 1100 only); LaserTwin software; SuperFonts 25; Canon CaPSL software; PrintAPlot software; ON-TAP software; and Freedom of Press software
- PostScript DECLaser 1150 Highlights
  - 43 resident PostScript fonts, plus support for downline-loadable fonts
  - PostScript/DEC ANSI protocol (LaserWriter compatible)
  - PostScript output in UNIX, ULTRIX, DOS, and VMS environments
  - Additional memory included
  - Includes HP LaserJet II P emulator

DECLaser 2000 plus (LN05/LN06) Family



DECLaser 2000 plus printers are available in four models: two models print DEC ANSI/sixel only and two models print both PostScript and DEC ANSI/sixel. All four printers are compact, quiet, fast, flexible, and easy to install and maintain.

With standard features such as serial and parallel (IBM/Centronics) interfaces, they can be connected to any of Digital's terminals, workstations, DECstation PCs, or other industry-standard PCs. For PC networks and Macintosh environments, optional Novell (2100/2150/2200/2250) and AppleTalk (2150/2250) connections are available to extend the DECLaser 2100 plus/2200 plus printers direct connect network operating environments.

All four versions of the DECLaser 2000 plus printers print on standard, legal, and international paper sizes as well as envelopes, transparencies, and labels. An adjustable slot located at the top of the paper tray allows for manual feed of a single sheet of paper, transparency, label, or envelope. Optional font cartridges are available for HP PCL/IBM ProPrinter and other families of popular font cartridges.

DECLaser 2150 plus/2250 plus printers support DEC ANSI/sixel and PostScript. PostScript by Adobe is the industry-standard page description language offering flexibility and device independence. With the availability of PostScript, multiple type styles can be integrated with graphics; images can be rotated, enlarged, or reduced; and line art, text, and digitized photographs can be used within one document.

With Digital PostScript support, full compatibility with VMS PostScript applications is provided. Forty-three PostScript resident fonts are included with the DECLaser 2150 plus/2250 plus. These fonts are used in Digital and industry-standard applications. With Apple LaserWriter compatibility, users have access to PC, UNIX, and ULTRIX applications, written to support the Apple LaserWriter.

The "U" versions of the DECLaser 2150 plus/2250 plus are ideal for printing in a non-VMS environment. These versions contain all the features of the basic DECLaser 2100 plus or 2200 plus, as well as the industry-standard Adobe PostScript page description language. In addition, with DECLaser PostScript printers, thousands of applications written to support PCs, UNIX, and ULTRIX operating systems can be accessed. These printers contain 43 PostScript fonts, which are compatible with Apple LaserWriter printing through PATHWORKS for Macintosh software.

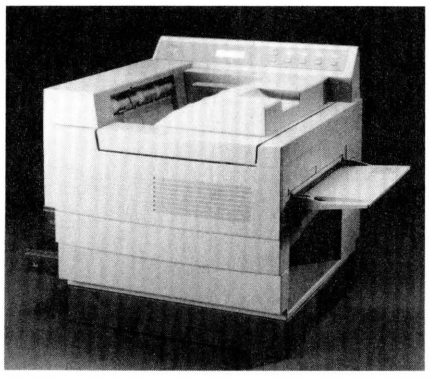
DEClaser 2000 plus Family
(Continued)

For VAX PostScript printing, DECprint Printing Services for VMS is an optional layered product required by VMS systems to access and control the DEClaser 2150 plus/2250 plus PostScript printers. It must be installed on each VMS V5.3 or higher CPU or a single CPU within a cluster that will be sending print jobs to a Digital PostScript printer. It contains the print command interpreters and translators required to print documents formatted in a number of industry-standard or proprietary protocols (ASCII, ANSI/LN03, PostScript, DDIF, Tektronix 4010/4014, HP Laser II P, and Apple LaserWriter).

Features

- Prints up to eight pages per minute at 300- by 300-dot-per-inch resolution
- DEClaser 2100 plus (simplex only); DEClaser 2200 plus (simplex/duplex)
- Standard EIA-232 serial and parallel (IBM/Centronics) interfaces, includes DECconnect adapter and cable
- Variety of optional font cartridges (credit-card sized)
- Optional memory upgrade cards (graphics applications may require additional memory)
- DEClaser 2200 plus/2250 plus models include two paper cassettes
- Optional large capacity input tray (1000 sheets)
- Monthly usage: DEClaser 2100 plus/2150 plus—up to 16,000 pages/month; DEClaser 2200 plus/2250 plus—up to 20,000 pages/month
- Optional large capacity output stacker (500 sheets)
- Optional auto-envelope feeder (50 envelopes) used in addition to two standard paper cassettes (available on DEClaser 2200 plus/2250 plus models only) for first sheet, second sheet, and envelopes
- DEClaser 2150 plus/2250 plus highlights
  - 43 resident PostScript fonts, plus support for downline-loadable fonts
  - PostScript/DEC ANSI protocol (LaserWriter compatible)
  - PostScript output in UNIX, ULTRIX, DOS and VMS environments
  - Additional memory included
- Optional software (see product descriptions at the end of this chapter): DECprint Utility software; LaserTwin software for HP-LaserJet II emulation, for the DEClaser 2100 plus/2200 plus; SuperFonts 25 software; Canon CaPSL software; PrintAPlot software; ON-TAP software; and Freedom of Press software

DEClaser 3200/3250 (LN08) Family



DEClaser 3200 and 3250 printers offer fast (13-page-per-minute), duplex (double-sided) and simplex (single-sided) printing on a variety of media— cut-sheet paper, transparencies, envelopes, and labels. The printers support Digital ANSI-compliant printing protocol (DEC PPL3) and emulate HP LaserJet II D (PCL Level 4). The DEClaser 3250 printer also supports an emulation that is compatible with Adobe's PostScript page description language. For PC network environments, an optional Novell Ethernet connection is offered to extend the DEClaser 3200/3250 printers' direct connect network operating environments.

The DEClaser 3200 and 3250 printers offer two input trays, each with a capacity of 250 sheets of standard paper, and an output tray capacity of up to 500 sheets. With an optional 1,500-sheet large capacity input tray, total paper input capacity is 2,000 sheets. A separate manual feed tray allows users to feed a single sheet, transparency, label, or envelope without removing either of the two paper cassettes.

DEClaser 3200/3250 Family
(Continued)

The DEClaser 3250 printer is compatible with Adobe's PostScript page description language. It offers 43 resident fonts, including the 35 industry-standard Apple LaserWriter fonts. The DEClaser 3250 printer also supports the optional DECfonts Typeface Collection for VMS and ULTRIX, which offers an extensive library of PostScript Type 1 Typefaces by Adobe.

The "U" version of the DEClaser 3250 is ideal for printing in a non-VMS environment. This version contains all the features of the basic DEClaser 3200, plus an emulation that is compatible with Adobe's PostScript page description language. In addition, with DEClaser PostScript printers, thousands of applications that are written to support PCs, UNIX, and ULTRIX operating systems can be accessed.

The DEClaser 3250 ("R" version) printer offers an optional DECprint Printing Services for VMS* license, which allows printing in heterogeneous environments. It makes PostScript the common denominator for many applications, translating printer input of different data types into PostScript and printing it on a PostScript printer. For occasional PostScript printing, the DEClaser 3200 printer can use the optional DECprint Utility for PostScript to Sixel Printing for VMS. This software converts PostScript files to sixel format used by most of Digital's desktop printers.

* VMS version 5.3 or higher is required to run DECprint Printing Services for VMS, V4.1.

Features

- Prints up to 13 pages per minute
- Duty cycle of up 35,000 pages per month
- Double-sided (duplex) and single-sided (simplex) printing
- Built-in HP LaserJet II D protocol emulation
- Compatible with thousands of PC, Macintosh, VMS, and PostScript applications
- Compatible with VMS applications such as DECwrite, DECpage, and DECpresent for the LN03 and other DEClaser family printers (3250 only)
- Standard DECconnect serial and PC-compatible parallel interfaces (3250 only)
- Optional Novell Ethernet interface (3250 only)

DEClaser Printer Family Ordering Information

Country or Region/ Language	DEClaser 1100 (LN07)	DEClaser 1150 (LN07)	DEClaser 2100[1] plus (LN05)	DEClaser 2150 plus (LN05)	DEClaser 2200[2] plus (LN06)	DEClaser 2250 plus (LN06)	DEClaser 3200 (LN08)	DEClaser 3250 (LN08)
North American/English	LN07-CA LN07P-CA[7]	LN07R-CA[3] LN07U-CA[5]	LN05-CA LN05P-CA[7]	LN05R-CA[3] LN05U-CA[5]	LN06-CA LN06P-CA[7]	LN06R-CA[3] LN06U-CA[5]	LN08-CA	LN08R-CA[6] LN08U-CA[4]
Australia, New Zealand/ English	LN07-AZ	LN07R-AZ[3] LN07U-AZ[5]	LN05-AZ	LN05R-AZ[6] LN05U-AZ[4]	LN06-AZ	LN06R-AZ[6] LN06U-AZ[4]	LN08-AZ	LN08R-AZ[6] LN08U-AZ[4]
Belgium/Flemish	LN07-CD	LN07R-CD[3] LN07U-CD[5]	LN05-CD	LN05R-CD[6] LN05U-CD[4]	LN06-CD	LN06R-CD[6] LN06U-CD[4]	LN08-CD	LN08R-CD[6] LN08U-CD[4]
Canada/English	LN07-CA	LN07R-CA[3] LN07U-CA[5]	LN05-CA	LN05R-CA[6] LN05U-CA[4]	LN06-CA	LN06R-CA[6] LN06U-CA[4]	LN08-CA	LN08R-CA[6] LN08U-CA[4]
Canada/French	LN07-CA	LN07R-CA[3] LN07U-CA[5]	LN05-CA	LN05R-CA[6] LN05U-CA[4]	LN06-CA	LN06R-CA[6] LN06U-CA[4]	LN08-CA	LN08R-CA[6] LN08U-CA[4]
Denmark/Danish	LN07-AD	LN07R-AD[3] LN07U-AD[5]	LN05-AD	LN05R-AD[6] LN05U-AD[4]	LN06-AD	LN06R-AD[6] LN06U-AD[4]	LN08-AD	LN08R-AD[6] LN08U-AD[4]
Finland/Finnish	LN07-CC	LN07R-CC[3] LN07U-CC[5]	LN05-CC	LN05R-CC[6] LN05U-CC[4]	LN06-CC	LN06R-CC[6] LN06U-CC[4]	LN08-CC	LN08R-CC[6] LN08U-CC[4]
France/French	LN07-CD	LN07R-CD[3] LN07U-CD[5]	LN05-CD	LN05R-CD[6] LN05U-CD[4]	LN06-CD	LN06R-CD[6] LN06U-CD[4]	LN08-CD	LN08R-CD[6] LN08U-CD[4]
Holland/Dutch	LN07-CD	LN07R-CD[3] LN07U-CD[5]	LN05-CD	LN05R-CD[6] LN05U-CD[4]	LN06-CD	LN06R-CD[6] LN06U-CD[4]	LN08-CD	LN08R-CD[6] LN08U-CD[4]
Israel/Hebrew	LN07-AT	LN07R-AT[3] LN07U-AT[5]	LN05-AT	LN05R-AT[6] LN05U-AT[4]	LN06-AT	LN06R-AT[6] LN06U-AT[4]	LN08-AT	LN08R-AT[6] LN08U-AT[4]
Italy/Italian	LN07-AI	LN07R-AI[3] LN07U-AI[5]	LN05-AI	LN05R-AI[6] LN05U-AI[4]	LN06-AI	LN06R-AI[6] LN06U-AI[4]	LN08-AI	LN08R-AI[6] LN08U-AI[4]
Norway/Norwegian	LN07-CC	LN07R-CC[3] LN07U-CC[5]	LN05-CC	LN05R-CC[6] LN05U-CC[4]	LN06-CC	LN06R-CC[6] LN06U-CC[4]	LN08-CC	LN08R-CC[6] LN08U-CC[4]
Portugal/Portuguese	LN07-CC	LN07R-CC[3] LN07U-CC[5]	LN05-CC	LN05R-CC[6] LN05U-CC[4]	LN06-CC	LN06R-CC[6] LN06U-CC[4]	LN08-CC	LN08R-CC[6] LN08U-CC[4]
Spain/Spanish	LN07-CC	LN07R-CC[3] LN07U-CC[5]	LN05-CC	LN05R-CC[6] LN05U-CC[4]	LN06-CC	LN06R-CC[6] LN06U-CC[4]	LN08-AS	LN08R-AS[6] LN08U-AS[4]
Sweden/Swedish	LN07-CC	LN07R-CC[3] LN07U-CC[5]	LN05-CC	LN05R-CC[6] LN05U-CC[4]	LN06-CC	LN06R-CC[6] LN06U-CC[4]	LN08-CC	LN08R-CC[6] LN08U-CC[4]
Switzerland/French	LN07-CB	LN07R-CB[3] LN07U-CB[5]	LN05-CB	LN05R-CB[6] LN05U-CB[4]	LN06-CB	LN06R-CB[6] LN06U-CB[4]	LN08-CB	LN08R-CB[6] LN08U-CB[4]
Switzerland/German	LN07-CB	LN07R-CB[3] LN07U-CB[5]	LN05-CB	LN05R-CB[6] LN05U-CB[4]	LN06-CB	LN06R-CB[6] LN06U-CB[4]	LN08-CB	LN08R-CB[6] LN08U-CB[4]
Switzerland/Italian	LN07-CB	LN07R-CB[3] LN07U-CB[5]	LN05-CB	LN05R-CB[6] LN05U-CB[4]	LN06-CB	LN06R-CB[6] LN06U-CB[4]	LN08-CB	LN08R-CB[6] LN08U-CB[4]
U.K., Ireland/England	LN07-AE	LN07R-AE[3] LN07U-AE[5]	LN05-AE	LN05R-AE[6] LN05U-AE[4]	LN06-AE	LN06R-AE[6] LN06U-AE[4]	LN08-AE	LN08R-AE[6] LN08U-AE[4]
Germany, Austria/German	LN07-AG	LN07R-AG[3] LN07U-AG[5]	LN05-AG	LN05R-AG[6] LN05U-AG[4]	LN06-AG	LN06R-AG[6] LN06U-AG[4]	LN08-AG	LN08R-AG[6] LN08U-AG[4]

[1] Simplex (single-sided)
[2] Duplex (double-sided)
[3] Includes VMS software license.
[4] Does not include DECprint Printing Services for VMS license.
[5] Does not include VMS software license.
[6] Includes DECprint Printing Services for VMS license.
[7] Includes PCL emulation.

Upgrade Kits

LN07U-UA PostScript upgrade kit for DEClaser 1100 (includes PostScript cartridge and 2 Mbytes of memory)

LN07R-UA PostScript upgrade kit for DEClaser 1100 (includes PostScript cartridge, VMS software license, and 2 Mbytes of memory)

LN05U-UA PostScript upgrade kit for DEClaser 2100 plus (includes PostScript cartridge and 2 Mbytes of memory)

LN05R-UA PostScript upgrade kit for DEClaser 2200 plus (LN07) (includes PostScript cartridge, VMS software license, and 2 Mbytes of memory)

LN06U-UB PostScript upgrade kit for DEClaser 2200 plus (includes PostScript cartridge and 2 Mbytes of memory)

LN06R-UB PostScript upgrade kit for DEClaser 1100 (LN07) (includes PostScript cartridge, VMS software license, and 2 Mbytes of memory)

LN08U-UA PostScript upgrade kit for DEClaser 3200 (includes PostScript cartridge and 2 Mbytes of memory)

LN08R-UA PostScript upgrade kit for DEClaser 3200 (LN07) (includes PostScript cartridge, VMS software license, and 2 Mbytes of memory)

Accessories and Supplies

Note: For cable/adapter information, refer to the *Desktop Printers Cable and Adapter Guide* that follows the LA75 Plus ordering information.

Option	DEClaser 1000 Family (LN07)	DEClaser 2000 plus Family (LN05/LN06)	DEClaser 3200/3250 (LN08)
Toner cartridge kit	LN07X-AA	LNXX-AC[1]	LN08X-AA
Photoreceptor kit	—	—	LN08X-AB
Developer kit	—	—	LN08X-AC
CG Times proportional spaced font cartridge	LNXX-CA	LNXX-CA	LN08X-CA
CG Triumverate proportional spaced font cartridge	LNXX-CB	LNXX-CB	LN08X-CB
ITC Souvenir and Script proportional spaced Font Cartridge	LNXX-CC	LNXX-CC	LN08X-CC
Monospaced font cartridge	LNXX-CD	LNXX-CD	LN08X-CD
LaserJet IIP (HP PCL4) and ProPrinter X24E emulation cartridge	LNXX-PC	LNXX-PC	LNXX-PC
MicroSoft PCL font cartridge	LN07X-HM	LN07X-HM	LN08X-CI
WordPerfect PCL font cartridge	LN07X-HW	LN07X-HW	—
Multifont PCL font cartridge	LN07X-HT	LN07X-HT	—
CaPSL ROM cartridge (Canon LBP printer emulation)	LNXX-CN	LNXX-CN	—
Media kit (one each: LN01X-AB, H9850-TA LNXX-AC; two each LN03X-AJ	—	LNXX-SA	—
Paper tray kit (one each: LNXX-LA, LNXX-LT LNXX-LN, LNXX-LE, LNXX-AC)	—	LNXX-SB	—
CG font library kit (1 each: LNXX-AC, LNXX-CA, LNXX-CB)	LNXX-SC	LNXX-SC	—
DEClaser font library kit (1 each: LNXX-AC, LNXX-CA, LNXX-CB, LNXX-CC, LNXX-CD)	LNXX-SD	LNXX-CD	—
PostScript cartridge (requires optional memory), documentation, and VMS software license	LN07X-PS	LNXXR-PS	—
PostScript cartridge (requires optional memory), documentation, and no VMS software license	LN07U-PS	LNXXU-PS	—
Toner cartridge	LN07X-AA	LNXX-AC[1]	LN08X-AA
A4 size paper tray	LN07X-TA	LNXX-LB	LN08X-TA
Legal-size paper cassette	LN07X-TB	LNXX-LA	LN08X-TB
Letter-size paper cassette	LN07X-TC	LNXX-LT	LN08X-TC
Envelope cassette	LN07X-TD	LNXX-LN	—
Automatic envelope feeder (2200 and 2250 only)	—	LN06X-EF	LN08X-TE
Large capacity input cassette (letter)	—	—	LN08X-TF
Large capacity input cassette (A4)	—	—	LN08X-TG
Large capacity output stacker	—	LNXX-LS	—
Executive size paper cassette	LN07X-TE	LNXX-LE	—
Adjustable paper cassette	—	—	LN08X-TD
Optional lower cassette with letter tray	LN07X-TF	—	—
Novell Ethernet interface	—	—	LN08X-NE
Large capacity output stacker	—	LNXX-LC	—
1-Mbyte RAM card	LN07X-MA	LNXX-UC	—
2-Mbyte RAM card	LN07X-UD	LNXX-UD	LN08X-UC
3-Mbyte RAM card	—	LNXX-UE	—
AppleTalk connection (for DEClaser 2150 plus/2250 plus only)	—	LNXX-AT	—
Novell connection	—	LNXX-NE	LNXX-NE
Mobile printer cabinet stand	LN03X-AE	LN03X-AE	—
Laser printer paper	LN01X-AB	LN01X-AB	LN01X-AB
Laser transparencies	LN03X-AJ	LN03X-AJ	LN03X-AJ
Laser labels	H9850-TA	H9850-TA	H9850-TA
Digital ANSI-Compliant Printing Protocol Level 3 Programmer's Reference Manual	AA-PBWGA-TE	AA-PBWGA-TE	—
Digital ANSI-Compliant Printing Protocol Level 3 Supplement to Programmer's Reference Manual	AA-PBWHA-TE	AA-PBWHA-TE	—
PostScript Programming Supplement	AA-HL84E-TE	AA-HL84E-TE	—

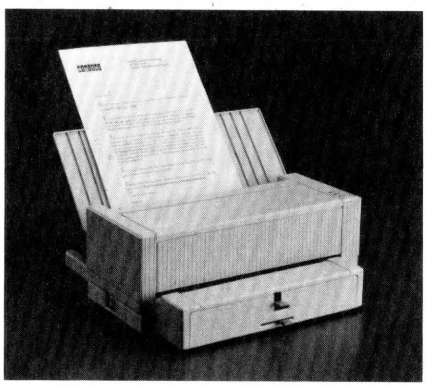
[1] DEClaser 2000 plus toner cartridge kits can be purchased in bulk quantities at a discounted price; LNXX-XA = four kits: LNXX-XB = 16 kits; LNXX-XC = 64 kits.

DEClaser Printer Family Specifications

	DEClaser 1000 (LN07)		DEClaser 2100 plus/2150 plus (LN05)		DEClaser 2200 plus/2250 plus (LN06)		DEClaser 3200/3250 (LN08)	
Physical Characteristics								
Height	20.4 cm (8.0 in.)		23.8 cm (9.4 in.)		31.2 cm (12.3 in.)		49.6 cm (19.5 in.)	
Width	35.0 cm (13.8 in.)		45.2 cm (17.8 in.)		45.2 cm (17.8 in.)		67.0 cm (26.4 in.)	
Depth	40.5 cm (15.9 in.)		51.0 cm (20.1 in.)		68.5 cm (27.0 in.)		53.6 cm (21.1 in.)	
Weight	11.0 kg (25.0 lb)		19.1 kg (42.0 lb)		29.0 kg (64.0 lb)		38 kg (85 lb)	
Power Requirements								
Voltage	100/115 V	220/240 V	100/115 V	220/240 V	100/115 V	220/240 V	120 V	220/240 V
Frequency	50–60 Hz	50 Hz	50–60 Hz	50 Hz	50–60 Hz	50 Hz	60 Hz	50 Hz
Phases	1	1	1	1	1	1	1	1
Thermal dissipation (watts)	550	530	810	700	940	725	450	450
Thermal dissipation (Btu/h)	1875	1875	2764	2696	3208	3037	1535	1535
Communications								
Baud rate	300 to 19.2 Kbytes		300 to 19.2 Kbytes		300 to 19.2 Kbytes		1200 to 38.4 Kbytes	
Operating Environment								
Temperature	10° to 32.5° C		10° to 32.5° C		10° to 32.5° C		10° to 32° C	
Relative humidity	20% to 80%		20% to 80%		20% to 80%		20% to 80%	
Recommended humidity	20% to 80%		20% to 80%		20% to 80%		20% to 80%	
Altitude (max)	2500 m (8200 ft)		2500 m (8200 ft)		2500 m (8200 ft)		2000 m (6600 ft)	

DECjet 1000 and DECjet 2000 Ink-jet Printers

DECjet 1000

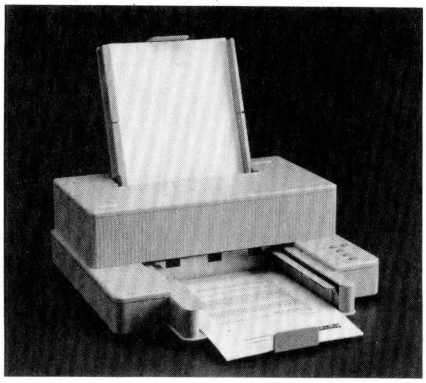


The DECjet 1000 is an ink-jet printer offering reliable, high-quality, monochrome printing on cutsheet paper, selected transparencies, and envelopes. Designed to support personal computers, it offers a parallel interface and HP DeskJet Plus emulation. It also offers optional IBM ProPrinter and Epson FX-850 printer emulation cards. The DECjet 1000 prints up to 160 characters per second with 300-dot-per-inch resolution.

Features

- Prints up to 160 characters per second, with a duty cycle of up to 400 pages per month
- Handles letter, legal, and international (A4) paper sizes; selected transparencies and envelopes
- Standard parallel (IBM Centronics) interface
- Offers built-in HP DeskJet Plus emulation
- Cartridge slot for font or emulation cartridges or RAM cards
- Optional 70-page sheet feeder
- Includes the following resident fonts: Courier, Courier Landscape, Times Nordic (proportional spacing), and Letter Gothic

DECjet 2000



The DECjet 2000 offers reliable, high-quality, monochrome printing on cutsheet paper, selected transparencies, and envelopes with 300-dot-per-inch resolution. It is designed to support personal computers and includes a parallel interface and HP DeskJet Plus emulation. Optional emulation cards are available for the IBM ProPrinter and Epson FX-850. The DECjet 2000 prints up to 360 characters per second.

Features

- Prints up to 360 characters per second, with a duty cycle of up to 800 pages per month
- Handles letter, legal, and international (A4) paper sizes; selected transparencies, and envelopes
- Standard parallel (IBM Centronics) interface
- Built-in HP DeskJet Plus emulation
- 150-page sheet feeder for legal or A4 sizes—a second 150-page sheet feeder is available as an option
- Two cartridge slots for font or emulation cartridges or for RAM cards
- Includes the following resident fonts: Courier, Courier Landscape, Times Nordic (proportional spacing), and Letter Gothic

Ordering Information

LJ16P-AA	DECjet 1000 Printer, North American Model
LJ36P-AA	DECjet 2000 Printer, North American Model
LJ16X-CA	IBM ProPrinter emulation card (DECjet 1000)
LJ36X-CA	IBM ProPrinter emulation card (DECjet 2000)
LJ16X-CB	Epson emulation card (DECjet 1000)
LJ36X-CB	Epson emulation card (DECjet 2000)

International Models

DECjet 1000	DECjet 2000	Country/Region	Language
LJ16P-AE	**LJ36P-AE**	U.K./Ireland	English
LJ16P-AT	**LJ36P-AT**	Israel	English
LJ16P-AZ	**LJ36P-AZ**	Australia/New Zealand	English
LJ16P-CC	—	Continental Europe	Multilingual
—	**LJ36P-CC**	Central Europe	Multilingual
—	**LJ36P-AD**	Denmark	English
—	**LJ36P-AI**	Italy	English
—	**LJ36P-AK**	Switzerland	Multilingual

Accessories and Supplies

LJ16X-SF	DECjet 1000 automatic sheet feeder (70-page)
LJ36X-SF	DECjet 2000 automatic sheet feeder legal size (150-page)
LJ36X-SG	DECjet 2000 automatic sheet feeder A4 size (150-page)
LJ50X-AA	Ink-jet cartridge (pack of one)
LJ50X-CA	Font cartridge; Prestige Elite, 3.5–10 points; Line Draw, 6–12 points; Math/PI, 5–10 points
LJ50X-CB	Font cartridge; Letter Gothic Landscape, 4.7–24 points
LJ50X-CC	Font cartridge; Information (Presentation), 7–18 points; Letter Gothic, 7–14 points; Line Draw, 6–12 points
LJ50X-CD	Font cartridge; Times Nordic (Times Roman)—proportional spacing, 4–14 points
LJ50X-CE	Font cartridge; Nordic (Helvetica)—proportional spacing, 4–14 points
LJ50X-CF	Font cartridge; Times Nordic (Times Roman)—proportional spacing, 15–30 points
LJ50X-CG	Font cartridge; Nordic (Helvetica)—proportional spacing, 15–30 points
LJ50X-DA	RAM extension card 256K

Cables and Adapters

BC19M-10	IBM/Centronics parallel cable

Specifications

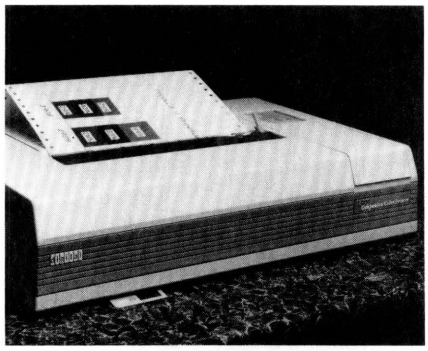
Physical Characteristics

	DECjet 1000 (LJ16P)		DECjet 2000 (LJ36P)
	Closed	**Open**	
Height	115 mm (4.5 in.)	275 mm (10.8 in.)	147 mm (5.8 in.)
Width	342 mm (13.5 in.)	342 mm (13.5 in.)	425 mm (16.7 in.)
Depth	147 mm (5.8 in.)	360 mm (14.2 in.)	450 mm (17.7 in.)
Weight	2.9 kg (6.4 lb)		9 kg (19.6 lb)
Print modes	Portrait and landscape		Portrait and landscape
Input buffer size	8 Kbytes		8 Kbytes
Optional memory upgrade cards	256 Kbytes		256 Kbytes

Power Requirements

Voltage	115/220/240	115/220/240
Frequency	50 or 60 Hz	50 or 60 Hz
Power Absorbed	20 W	35 W

LJ250/LJ252 Companion Color Printers



Digital's Companion Color Printers are quiet, compact desktop printers that create professional-looking documents—combining high-quality, color graphics with high-quality text. They are available in two models: LJ250, with DEC-423 and EIA-232 serial interfaces; LJ252, with a Centronics-type parallel interface. They employ cartridge technology, consisting of a printhead and ink supply, for high-quality text and graphics printing and no user maintenance. This technology allows printing of up to seven pure colors—including plain black ink—and hundreds of mixed colors on a single page. LJ250 and LJ252 print text and graphics on paper and transparencies in the A (8.5-by-11-inch) and European A4 (8.3-by-11-inch) sizes, using single-sheets or fanfold paper. Specially treated paper and transparencies from Digital provide optimum print quality.

Features

- Bold, bright colors
- Fast (167 ch/s burst, 90 ch/s throughput) and quiet (less than 45 dBA)
- Capable of printing PostScript output with optional DECprint Utility software
- Prints up to seven colors at 180-by-180 dpi resolution, and up to 255 colors at 90-by-90-dpi resolution
- Emulates the HP PaintJet printer for wide application support on IBM PCs and PC-compatibles through the Hewlett-Packard PCL protocol
- Supports Digital systems through DEC-PPL2 with color sixel extension
- Prints ReGIS graphics files using host-resident VAX ReGIS-to-Sixels Converter (RETOS) software or the print screen function on many of Digital's graphic terminals, PCs, or workstations
- Compact and lightweight [less than 4.5 kg (10 lb)]
- DECprint Utility for PostScript to Sixel Printing for VMS extends the printing capabilities (see product description at the end of this chapter)
- PrintAPlot software turns the LJ250 into a high-speed, high-resolution plotter (see product description at the end of this chapter)

Ordering Information

Model Number	Country or Region	Language
LJ25x-CA	U.S., Canada, Mexico, South America	English, French, Spanish, Portuguese
LJ25x-AB	Belgium	Flemish
LJ250-AD	Denmark	Danish
LJ25x-AE	U.K., Ireland	English
LJ25x-AG	Germany, Austria	German
LJ25x-AH	Holland	Dutch
LJ25x-AI	Italy	Italian
LJ25x-AS	Spain	Spanish
LJ25x-AT	Israel	Hebrew
LJ25x-AZ	Australia, New Zealand	English
LJ25x-AP	France	French
LJ25x-CB	Switzerland	English, French, German
LJ25x-CC	Finland, Norway, Portugal, Sweden	Finnish, Norwegian, Portuguese, Swedish

Note: Replace x with 0 for serial; 2 for parallel: parallel models include BC19M-10 10-ft (3.1-m) parallel cable

LJ250/LJ252 Companion Color Printers

Accessories and Supplies

LJ25X-AA	Color ink cartridge
LJ25X-AB	Black ink cartridge
LJ25X-AC	Continuous form paper (A size), 250 sheets
LJ25X-AD	Continuous form paper (A4 size), 250 sheets
LJ25X-AE	Cutsheet transparencies (A size), 50 sheets
LJ25X-AF	Cutsheet transparencies (A4 size), 50 sheets
LJ25X-DC	Dust cover
LAXXS-DS	Desk stand
LJ25X-SW	Paper catcher

Cables and Adapters

For more information on cabling and adapters, refer to the **Desktop Printer Cable and Adapter Guide** at the end of this chapter.

Specifications

Physical Characteristics

Height	9.0 cm (3.5 in.)
Width	42.5 cm (16.7 in.)
Depth	26.0 cm (10.2 in.)
Weight	4.5 kg (10.0 lb)

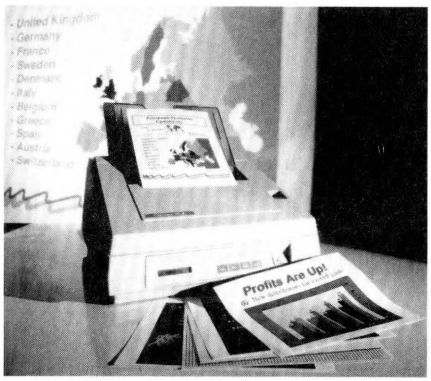
Power Requirements

Voltage	120 V	220 V	240 V
Frequency	59–61 Hz	49–51 Hz	49–51 Hz
Phases	1	1	1
Current ac amps (maximum)	0.17	0.091	0.083
Thermal dissipation (watts)	20	20	20
Thermal dissipation (Btu/h)	188	188	188

Operating Environment

Temperature	15° to 30° C (54.5° to 86° F)
Relative humidity	20% to 80% (paper); 20% to 70% (transparency)

Colormate PS Printer



The LF01R Colormate PS Printer includes an Adobe PostScript interpreter and outputs 300-dot-per-inch graphics in an array of colors. It prints on 8 1/2- × 11-inch paper and transparencies with highly saturated color. The LF01R Colormate simulates the PANTONE color matching system when used with PANTONE-certified software.

The Colormate's M68020 microprocessor and thermal transfer print engine combine to produce one full-color page per minute. The printer's 8 Mbytes of memory handles the most complex color art and photographs. Adobe PostScript interpreter provides shading, type scaling, and rotation capabilities and permits the Colormate to work with many popular graphics packages.

Standard EIA-232, EIA-422, Apple LocalTalk and Centronics parallel interfaces permit integration with any network, multiuser system, or personal computer. A built-in library of 35 Adobe fonts provides a variety of online selections, and the printer supports downloading of additional fonts.

The Colormate PS Printer fits comfortably in most environments and is designed for ease of use and serviceability. The thermal transfer printhead has no moving parts. A 16-character status display conveys configuration and operating information. All selections are made from the front panel.

Features

- Choice of three ribbons: four-color, three-color, and monochrome
- Printing speed:
  Monochrome letter: 3 pages/minute maximum
  Color letter: 1 page/minute maximum
- Prints cutsheets and transparencies
- 35 resident fonts
- Quiet—less than 53 dBA
- Supports DECpresent, DECpage, DECslide, and DECwrite application software
- Supports VMS DECprint Printing Services for VMS
- Supports systems that output in PostScript format

Ordering Information

With Software License*	Without Software License†	Country
LF01R-CA	**LF01U-CA**	North America
LF01R-CB	**LF01U-CB**	Switzerland
LF01R-CC	**LF01U-CC**	Finland/Norway/Portugal/ Sweden/Belgium/Holland/ France/Spain
LF01R-AD	**LF01U-AD**	Denmark
LF01R-AE	**LF01U-AE**	U.K.
LF01R-AG	**LF01U-AG**	Germany/Austria
LF01R-AI	**LF01U-AI**	Italy
LF01R-AT	**LF01U-AT**	Israel
LF01R-AZ	**LF01U-AZ**	Australia/NZ

Accessories and Supplies

For more information, refer to the *DECdirect* catalog.

LF01X-KA	Black ribbon
LF01X-KB	3-color ribbon letter size
LF01X-KC	3-color ribbon A4 size
LF01X-KD	4-color ribbon
LF01X-TP	Paper, letter size
LF01X-TQ	Paper, A4 size
LF01X-TT	Transparency letter size
LF01X-TU	Transparency A4 size

* Includes license for DECprint Printing Services for VMS.
† Does not include license for DECprint Printing Services for VMS.

Specifications

Physical Characteristics

Height	24.1 cm (9.5 in.)
Width	43.1 cm (17 in.)
Depth	45.7 cm (18 in.)
Weight	25 kg (55 lb)

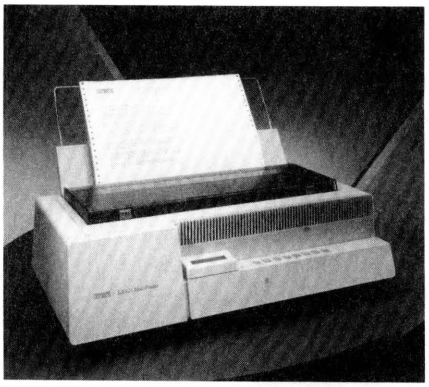
Power Requirements

Voltage	120 V	240 V	240 LMF
Frequency	50–60 Hz	50–60 Hz	
Phases	1	1	
Current ac amps (maximum)	4.0	2.0	
Thermal dissipation (Watts/h)	235	235	
Thermal dissipation (Btu/h)	1160	1160	

Operating Environment

Temperature	10° to 35° C (50° to 95° F)
Relative humidity	30% to 80%

LA424 MultiPrinter



The LA424 MultiPrinter is a high-resolution, wide-carriage, receive-only, impact, dot-matrix printer. It is well suited for various environments from the factory floor to the desktop to the datacenter. The LA424 MultiPrinter incorporates a 24-wire printhead.

It is a heavy-duty forms printer designed for usage of 6000 pages per month. The LA424 MultiPrinter is also designed for the IBM personal computer environment with its built-in IBM ProPrinter XL24 emulation mode and parallel interface. The LA424 MultiPrinter's paper and forms handling capabilities make it ideal for a variety of applications. For users who need spreadsheet and simple color output, the LA424 MultiPrinter offers a wide carriage and eight-color printing capability.

The rugged modular design of the LA424 MultiPrinter makes it very reliable for high-volume printing in areas such as online transaction processing, engineering and science, financial services, insurance, and banking.

Features

- Average duty cycle of up to 6000 pages per month
- 400 ch/s draft printing speed (burst); 133 ch/s letter-quality printing speed (burst)
- Prints color or monochrome PostScript output with optional DECprint Utility software
- Prints in black or color ink using snap-in ribbon cartridges
- Compatibility with Digital and IBM ProPrinter applications through Digital and IBM protocols
- Plug-in font cartridges for varying type styles
- Built-in bar code 39 printing capability
- Wide carriage enables printing 17-inch (43.2-centimeter) wide paper
- Equipped with built-in serial (DEC-423) and parallel (Centronics) interfaces
- Quiet printing mode at 51 dBA (front bystander position)
- Handles up to six-part forms as well as envelopes and labels
- Superior paper handling such as document-on-demand, autoload, autopark, and optional three-bin automatic sheetfeeder
- Automatic switching of universal power supply from 120 V, 220 V, or 240 V
- DECprint Utility for PostScript to Sixel Printing for VMS extends printing capabilities; see product description at the end of this chapter
- VAX ReGIS-to-Sixels Converter (RETOS) provides fast, flexible printing capabilities; see product description at the end of this chapter
- PrintAPlot software; see product description at the end of this chapter

Ordering Information

Model Number	Country or Region	Language
LA424-CA	U.S., Canada, Mexico, South America	English, French, Spanish, Portuguese
LA424-AB	Belgium	Flemish
LA424-AD	Denmark	Danish
LA424-AE	U.K., Ireland	English
LA424-AG	Germany, Austria	German
LA424-AH	Holland	Dutch
LA424-AI	Italy	Italian
LA424-AS	Spain	Spanish
LA424-AT	Israel	Hebrew
LA424-AZ	Australia, New Zealand	English
LA424-AP	France	French
LA424-CB	Switzerland	English, French, German
LA424-CC	Finland, Norway, Portugal, Sweden	Finnish, Norwegian, Portuguese, Swedish

Note: Replace x with 0 for serial; 2 for parallel (parallel models include BC19M-10 10-ft (3.1-m) parallel cable)

LA424 MultiPrinter

Accessories and Supplies

LA24X-CA	DEC Letter Gothic font cartridge
LA24X-CB	DEC Orator font cartridge
LA24X-CC	DEC Prestige Elite font cartridge
LA24X-CG	DEC OCR-A font cartridge
LA24X-CH	DEC OCR-B font cartridge
LA24X-CD	Font cartridge emulating IBM OCR-A
LA24X-CE	Font cartridge emulating IBM OCR-B
LA24X-CF	Font cartridge emulating IBM Presentor
LA24R-KA	Ribbon, black: up to 5M characters (six/box)
LA24R-KC	Ribbon, color: yellow, magenta, cyan, and black; up to 500,000 characters per color band (six/box)
LA24X-AC	Acoustic cover
LA24X-PS	Printer stand (pedestal style)
LA24X-DS	Desktop stand
LA24X-SF	Three-bin sheetfeeder
EK-LA324-PM	*Programmer's Reference Manual*

Cables and Adapters

For more information on cabling and adapters, refer to the **Desktop Printer Cable and Adapter Guide** at the end of this chapter.

H8673-AA	20 mA active host Mate-N-Lok-to-EIA-423 DECconnect MMJ passive converter
H8673-AB	20 mA active host RJ11 (6-pin) to EIA-423 DECconnect MMJ passive converter
BC19M-10	IBM/Centronics parallel cable
H8575-A	25-pin female-to-MMJ adapter
H8575-B	9-pin male-to-MMJ adapter (DEC)
H8571-C	25-pin cable-to-MMJ adapter
H8571-D	25-pin male-to-MMJ adapter (modem)
H8571-J	9-pin PC-type-to-MMJ adapter

Specifications

Physical Characteristics

Height	17.0 cm (6.7 in.)
Width	61.5 cm (24.2 in.)
Depth	31.0 cm (12.2 in.)
Weight	14.3 kg (31.5 lb)

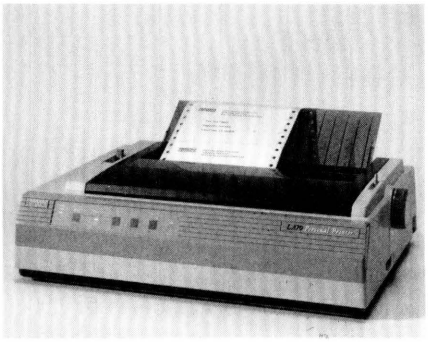
Power Requirements

Voltage	120 V	240 V
Frequency	50/60 Hz	50/60 Hz
Phases	1	1
Current ac amps (maximum)	1.4	0.7
Thermal dissipation (watts)	120	120
Thermal dissipation (Btu/h)	41	41
NEMA receptacle type	5–15R	5–15R

Operating Environment

Temperature	10° to 40° C (operating)
Relative humidity	10% to 90% (operating)
Altitude	2400 meters (8000 feet) maximum (operating)

LA70 Personal Printer



The LA70 Personal Printer is a versatile, compact, impact dot-matrix printer. It complements personal computers, terminals, and workstations and supports a wide range of applications.

It is a low-cost, entry-level printer for screen dump graphics printing and simple word processing. The LA70 offers print speeds up to 200 characters per second, in three printing densities. It has both a serial and a parallel interface, making it compatible with industry-standard PCs, terminals, or workstations.

The bidirectional LA70 prints in any one of three text printing densities: draft at 200 characters per second; memo at 100 characters per second; and near-letter-quality at 40 characters per second. It also prints bitmapped graphics. It offers built-in character sets that provide added capabilities for maximum versatility in word processing and other applications. A full multinational character set allows for printing in 14 languages.

The LA70 Personal Printer can print text with superscripts and subscripts, underlines, double underlines, shadow bold, italics, strike-through, and overline.

The front panel has well-labeled switches as well as LED indicators that display the printer's operating status.

Features

- Prints up to 1,000 pages per month
- Built-in IBM ProPrinter and Digital protocols
- Narrow carriage accommodates standard paper and envelope sizes
- Reliable 9-wire dot-matrix technology
- Printer settings selectable from front panel switches or through software control
- Convenient, versatile paper handling
- Accommodates fanfold, single sheets, labels, envelopes, and multipart forms (original plus two copies)
- Quiet Mode operation less than 52 dBA, activated by a front-panel switch; normal operation is less than 55 dBA
- Document-on-demand printing features: zero tear-off loss and viewing
- Serial and parallel interfaces built in to each printer (parallel cable must be ordered separately: BC19M-10)
- Auto Load feature automatically advances tractor-fed paper
- Viewing feature automatically advances page at end of text for easy reading
- Auto Park feature enables printing on either continuous tractor paper or cut-sheet paper without removing the tractor paper
- Optional software (see product description at the end of this chapter): ON-TAP; DECprint Utility software; RETOS; Reggie; and PrintAPlot

LA70 Personal Printer

Ordering Information

Model Number	Country or Region	Language
LA70-AA	U.S., Canada, Mexico, South America	English, French, Spanish, Portuguese
LA70-CB	Belgium, Finland, France, Holland, Norway, Portugal, Spain, Sweden, Switzerland	Flemish, Finnish, French, Dutch, Norwegian, Portuguese, Spanish, Swedish, English, German
LA70-AZ	Australia, New Zealand	English
LA70-AD	Denmark	Danish
LA70-AI	Italy	Italian
LA70-AJ	Japan	Katakana
LA70-AE	U.K., Ireland	English
LA70-AG	Germany, Austria	German
LA70-AT	Israel	Hebrew

Accessories and Supplies

LA70R-06	LA70 ribbon (6)
LAXXA-AA	LA70 desktop acoustic cover
LA70X-DP	LA70 desk stand and paper catcher
LA70X-DC	LA70 dust cover (10)
EK-LA70J-RM	*Programmer's Reference Manual*
LA70X-SF	LA70 single-bin sheet feeder

Cables and Adapters

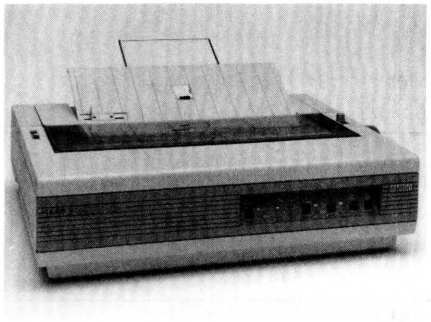
BC19M-10	IBM/Centronics parallel cable
H8575-A	25-pin male-to-MMJ adapter
H8575-B	9-pin male-to-MMJ adapter (Digital)
H8571-C	25-pin cable-to-MMJ adapter
H8571-D	25-pin male-to-MMJ adapter (modem)
H8571-J	9-pin (PC-type)-to-MMJ adapter
H8673-AA	20 mA active host Mate-N-Lok-to-EIA-423 DECconnect MMJ passive converter
H8673-AB	20 mA active host RJ11 (6-pin) to EIA-423 DECconnect MMJ passive converter

LA70 Personal Printer

Specifications

Physical Characteristics				
Height	12.0 cm (4.7 in.)			
Width	39.3 cm (15.5 in.)			
Depth	29.0 cm (11.4 in.)			
Weight	7.5 kg (16.0 lb)			
Power Requirements				
Voltage	100 V	120 V	220 V	240 V
Frequency	50–60 Hz	50–60 Hz	50–60 Hz	50–60 Hz
Phases	1	1	1	1
Current ac amps (maximum)	0.75	0.75	0.51	0.51
Thermal dissipation (watts)	68	69	68	67
Thermal dissipation (Btu/h)	188	188	188	188
Print Characteristics				
Aspect ratio	1:1, 2:1, or 2.5:1			
Print density	(horizontal × vertical dots)			
Draft mode	12 × 9 matrix			
Memo mode	24 × 9 matrix			
Near-letter-quality mode	24 × 17 matrix			
Character sets	U.S. ASCII, IBM ProPrinter (Line Drawing, Chart Drawing, Symbol Drawing), Katakana, 14 National Replacement Character Sets (NRC), ISO 8-bit Supplemental, DEC Supplemental, DEC Technical, VT100 Line Drawing, Hebrew			
Communications				
Character code	7- or 8-bit ASCII with odd, even, mark, space, or no parity			
Power Cord: 2.0 m (6.7 ft) long, detachable				
Operating Environment				
FCC Class B, Environmental—Class B (normal office environment)				
Temperature range	10° to 40° C (50° to 104° F)			
Relative humidity	10% to 90%			
Safety/performance	Certified by UL, CSA, FCC, VDE, IEC, and GS			
Buffer Control				
X-ON/X-OFF protocol READY/OFF LINE switch DTR buffer control				
Standard Font: Courier 10				

LA75 Plus Companion Printer



The LA75 Plus Companion Printer is a fast, flexible, dot-matrix printer that can be used as a personal printer or shared with other users. It can handle up to 2,000 pages per month. It uses a 24-wire impact dot-matrix printhead capable of 360 × 180 dots per inch (dpi) resolution for excellent print quality. The LA75 Plus printer supports applications running under VAX VMS, SCO UNIX, UNIX, and ULTRIX operating systems. The LA75 Plus also supports printing from Digital and other industry-standard personal computers, terminals, and workstations.

The LA75 Plus printer prints professional-looking office reports and graphs in color. It offers optional font cartridges for office documents or optical character recognition. The bar-code capability is resident in the LA75 Plus printer.

Features

- Supports both DEC PPL2 and IBM ProPrinter emulation
- Displays last line printed, eliminating the need to move the platen to see the last line
- Advances paper for tearing and repositions it for printing (eliminates wasted forms)
- Handles various sizes of paper and envelopes
- Provides choice of print quality from quick draft to letter-quality
- Allows quick, easy selection of printer settings, either from the front panel or software
- Tractor-fed paper can be temporarily bypassed—single sheets can be fed without removing the continuous-form paper
- Automatically senses data and selects the appropriate interface
- Adds color to office documents and graphs
- Five of the most commonly used ROM-based type fonts are available as options to create professional-looking documents
- Handles downline-loaded fonts
- Prints multipart forms and labels through the bottom feed slot
- Can simultaneously connect to two hosts, allowing printing from either host

Ordering Information

Model Number	Country or Region	Language
LA75S-AA	U.S., Canada, Mexico, South America	English, French, Spanish, Portuguese
LA75S-CB	Belgium, Finland, France, Holland, Norway, Portugal, Spain, Sweden, Switzerland	Flemish, Finnish, French, Dutch, Norwegian, Portuguese, Spanish, Swedish, English, German
LA75S-AZ	Australia, New Zealand	English
LA75S-AD	Denmark	Danish
LA75S-AI	Italy	Italian
LA75S-AJ	Japan	Katakana
LA75S-AE	U.K., Ireland	English
LA75S-AG	Germany, Austria	German
LA75S-AT	Israel	Hebrew

Accessories and Supplies

LA75R-KA	LA75S black ribbon (6)
LA75R-KC	LA75S color ribbon (1)
BC19M-10	Parallel cable
LAXXS-DS	LA75S wire paper catcher
H9850-HP	LA75S dust cover

LA75 Plus Companion Printer

Accessories and Supplies (Continued)

LAXXS-AB	LA75S floor stand
PCXXA-PC	Platen cleaner
LA75Y-SF	LA75S single bin sheetfeeder
EK-L75PL-DK	*Programmer's Reference Manual*

Font Cartridges

LA75Y-CA	LA75S Letter Gothic
LA75Y-CB	LA75S Orator
LA75Y-CC	LA75S Prestige Elite
LA75Y-CD	LA75S OCR-A
LA75Y-CE	LA75S OCR-B

Cables and Adapters

BC19M-10	IBM/Centronics parallel cable
H8571-A	25-pin male-to-MMJ adapter
H8571-B	9-in male-to-MMJ adapter (Digital)
H8571-C	25-pin cable-to-MMJ adapter
H8571-D	25-pin male-to-MMJ adapter (modem)
H8571-J	9-pin (PC-type)-to-MMJ adapter
H8673-AA	20 mA active host Mate-N-Lok-to-EIA-423 DECconnect MMJ passive converter
H8673-AB	20 mA active host RJ11 (6-pin) to EIA-423 DECconnect MMJ passive converter

Specifications

Physical Characteristics

Height	13.4 cm (5.3 in.)
Width	36.9 cm (14.5 in.)
Depth	42.7 cm (16.8 in.)
Weight	10.5 kg (23 lb)

Power Requirements

Voltage/frequency	100 V, 50/60 Hz; 120 V, 50/60 Hz; 220 V, 50/60 Hz; 240 V, 50/60 Hz
Power cord	2.0 m (6.7 ft), detachable
Operating environment	FCC Class B, Environmental-Class B (normal office environment)
Temperature range	10° C to 40° C (50° F to 104° F)
Relative humidity	10% to 90%
Safety/performance	Certified by UL, CSA, FCC, VDE, IEC, and GS

Hardware Characteristics

Interfaces	EIA-423 (MMJ) and Centronics Parallel Interface	
Noise level	Normal < 53 dBA; quiet < 51 dBA	
Baud rate	200, 300, 600, 1200, 2400, 4800, and 9600	
Buffer control	XON/XOFF protocol DTR buffer control	
Print speed (maximum)	Draft mode	250 cps
	Memo mode	125 cps
	Letter-quality mode	83 cps

Print Characteristics

Horizontal pitch	Standard width characters: 10, 12, 16.5, 17.1 chars/inch Double width characters: 5, 6, 8.25, 8.55 chars/inch	
Vertical pitch	2, 3, 4, 6, 8, and 12 lines/inch 1, 2, and 4 lines/cm	
Print density (horizontal × vertical dots)	Draft mode	9 × 24 matrix
	Memo mode	18 × 24 matrix
	Letter-quality mode	30 × 24 matrix
Optional fonts	Orator, Letter Gothic, Prestige Elite, OCR-A, and OCR-B	

Desktop Printer Cable and Adapter Guide

The following chart is a guide for connecting printers to video terminals, hosts, and terminal servers (cables and adapters are included with most Digital printers).

Serial Connections

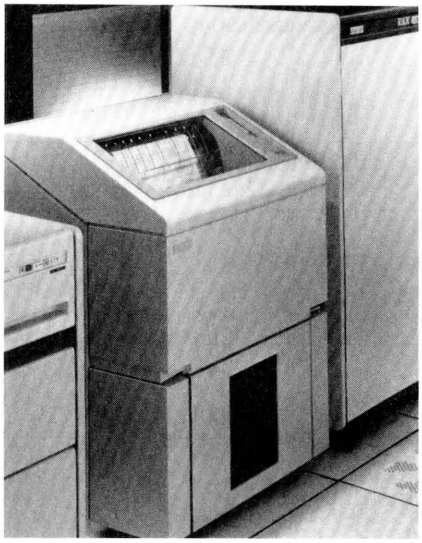
Connector Type Video device/server	LA70, DEClaser 1000/2000/3000 Series,[2] LA75, LJ250,[2] LA424, LF01,[2] LA75 Plus	LA210 and other Digital EIA232 printers
DEC-423 (MMJ) DECserver 300/90L/200 DL VT420, VT1200, VT300 Family VAX/VAXservers with CXY16 VAXstation 3100 MicroVAX 3100/DECsystem 5100 DECsystem 5000 Series with CXY16 DECstation 3100/2100/5000	BC16E[1] or H8673-AA[10] or H8673-AB[11]	H8575-A and BC16E
25-pin female (EIA-232) VT100 Series DECserver 200/MC (DSRVB-AA) VAX with CXY08 DECsystem with CXY08 IBM PC and PS/2, or compatible[8]	H8575-A and BC16E[1]	BC22D[4]
9-pin male (EIA-232) VT200 Family VAXstation 2000 MicroVAX II (std) DECmate II/III	H8575-B and BC16E[1]	BCC05
9-pin serial (PC/AT type) DECstation PCs IBM PC/AT or compatible[8]	H8571-J and BC16E[1]	H8672-A[3,6]
25-pin male (EIA-232) Modems[7] Rainbow	H8571-D and BC16E[1]	BCC14[10]
Open DECconnect RJ45 MJJ	BN24H-03	H8575-A and BN24H-03
20 mA Active Host Mate-N-Lok	H8673-AA	H8575-A and H8673-AA
20 mA Active Host RJ11	H8673-AB	H8575-A and H8673-AB

Parallel Connections (PC-type)

Connector Type Video device/server	LA75 Plus,[5] LA70, DEClaser series LJ252,[5] LA424, LF01, DECjet 1000/2000	LA210
25-pin PC port Centronics parallel DECstation PCs IBM PC or compatible IBM PS/2	BC19M-10	LA10X-EP[6] and BC19M-10

[1] BC16E-10 is included with LA70, LA75, LJ250, LA424, LF01, and the DEClaser family printers.
[2] Use the H8571-E adapter included with these printers.
[3] H8672-A includes H8571-J, H8575-A, and BC16E-10 cable.
[4] Not for connecting LQP45 directly to host port.
[5] BC19M-10 is included with LA75P and LJ252.
[6] For LA210, IBM Graphics Printer Emulation cartridge recommended (LA10X-LE).
[7] DECconnect (MMJ) does not provide full modem control; this combination works with Digital modems and many non-Digital modems.
[8] To connect the LA75, LA210, LN03, LN03 PLUS, ScriptPrinter, or LQP45 to non-Digital PCs, XON-XOFF serial flow is required. This is supported by many application packages, including Digital's PCSA client software (check your application).
[9] DEC-423 cabinet kits also available.
[10] 20 mA active host Mate-N-Lok to EIA-423 (MMJ) converter.
[11] For 20 mA systems that require an RJ11 interface.

LP29 Line Printer



The LP29 system printer operates at speeds up to 2000 lines/min through the use of a Digital unique interface and optimized character band. The interface allows the LP29 to accept continuous input from the CPU while it is printing. The proprietary optimized character band is a special arrangement of 64 uppercase characters that permits greater speeds without sacrificing print quality or character selection.

The LP29 is the ideal printer for Digital's high-performance systems. Its rugged design allows it to withstand continuous impact at very high speeds. The LP29 is designed for Digital's UNIBUS or VAXBI and Q-bus systems. It includes a universal power supply and prints using a proprietary optimized 64-character uppercase ASCII set or 1500 li/min using a 96-character uppercase and lowercase ASCII set. Character bands and paper and ribbon handling are easy for the operator. Self-test diagnostics are built in, and a powered paper stacker is standard. OCR-B and 64-character bands are optional.

The LP29 can be placed in a network environment utilizing the DECserver 250 network server for printers. VAX Vertical Forms Printing is available for improved productivity (up to 35 percent) in VFU applications with the LP29 printer in the VAX VMS environment.

Features

- Proprietary optimized character band
- Front paper handling
- High slew speed
- Accepts pinfeed, continuous fanfold paper
- Accepts forms, including carbons, with as many as six parts in a variety of widths and thicknesses
- Has 132-character buffer capacity

Ordering Information

LP29-UA/U3	LP29 UNIBUS system printer with LP11 controller, BC05L-10 10-ft (3-m) cable, bulkhead, and BC27A-30 30-ft (9.5-m) data cable. Includes powered paper stacker. 120/240 V
LP29-VA/V3	LP29 system printer with BC27A-30 30-ft (9.5-m) data cable and powered paper stacker. For use with DECserver 250 and VAXBI systems. *Prerequisite for VAXBI systems:* DMB32 controller (not included). 120/240 V
LP29-SA/S3	LP29 Q-bus system printer with LPV11-SA controller, BC27L-30 30-ft (9.5-m) data cable, and powered paper stacker. For use on BA2xx or VAX 4000 system. 120/240 V.
LP29-QA/Q3	LP29 Q-bus system option with LPV11 controller for the MicroVAX II, BC27A-30 30-ft (9.5-m) data cable and powered paper stacker. For use with BA23 and BA123 enclosures. 120/240 V.

Accessories and Supplies

For more information, see the *DECdirect* catalog.

LP29R-01	5-mil nylon ribbon, 22.8 m (75 ft)
LP29R-02	Ribbon shield
LP29X-AA	U.S. 64-character band
LP29X-AC	U.S. 64-character band optimized
LP29X-AD	U.S. 96-character band
LP29X-AE	U.S. OCR-B 96-character band
LP29X-AF	U.S. OCR-B 64-character band

Ordering Information *(Continued)*

Country Kits

Country kits include power cord and documentation.

LP29-KD	Denmark
LP29-KE	U.K.
LP29-KG	Germany
LP29-KI	Italy
LP29-KJ	Japan
LP29-KM	Sweden
LP29-KP	France
LP29-KS	Spain
LP29-KV	Portugal

Options

DSRVP-AA/AB	DECserver 250 with license. Refer to Chapter 6, *Networks, Communications, and Cables,* for more information and prerequisite software.
QL-VZEA9-AA	VAX Vertical Forms Printing V1.0 generic license for VMS.
QA-VZEAA-H5	VAX Vertical Forms Printing media (TK50) and documentation.
QA-VZEAA-HM	VAX Vertical Forms Printing media (magtape) and documentation.

Configuring Information

Model Number	Mounting Requirements	dc Amps Drawn @			Bus Loads Drawn	I/O Panel Units
		5 V	15 V	−15 V		
LP29-UA/U3	1 quad slot	1.5	0.0	0.0	1.0	1
LP29-VA/V3	DMB32 DMF32	N/A	N/A	N/A	N/A	N/A
LP29-SA/S3	1 quad slot	2.4	N/A	N/A	1.0	N/A
LP29-QA/Q3	1 quad slot		N/A	N/A		N/A

Specifications

Physical Characteristics

Height	124.5 cm (49.0 in.)
Width	90.0 cm (35.5 in.)
Depth	98.0 cm (38.5 in.)
Weight	255.0 kg (560.0 lb)

Power Requirements

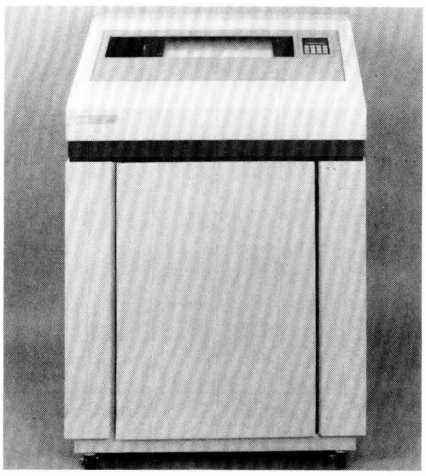
Voltage	120 V	240 V
Frequency	50–60 Hz	50–60 Hz
Phases	1	1
Thermal dissipation (watts)	1044	1044
Thermal dissipation (Btu/h)	4013	4013

Operating Environment

Temperature	10° to 40° C (50° to 104° F)
Relative humidity	20% to 80%
Altitude	2.4 km (8000 ft)

For more information contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.

LP37 Line Printer



Suitable for the open office environment, the LP37 is a high-speed parallel line printer. It is supported on all Digital systems utilizing VMS operating systems and LP11, LPV11, LPV11-SA, DMF32, and DMB32 controllers. The LP37 prints fully formed characters at 10 per inch and 132 per line at speeds up to 1200 li/m. Both the 64-character uppercase band and the 96-character upper- and lowercase "C" font bands are standard. OCR "A" 96-character band and OCR "B" 64- and 96-character bands are optional.

The LP37 is ideal for printing volume jobs in office (acoustic level 55 dBA) or MIS environments. The LP37 can be placed in a networked environment utilizing the DECserver 250 network server for printers.

VAX Vertical Forms Printing (VFP) is available for improved productivity in VFU applications with the LP37 printer in the VAX VMS environment. Productivity is improved up to 47 percent based upon the application. A power paper stacker is standard, and both single and six-part forms stack in an enclosed paper cavity behind the printer. Ribbons and bands are easy to change, and the power paper stacker enhances paper handling for medium-duty cycle jobs. Format changes and setups are easily accomplished. The LCD control panel displays messages. The quick-reference flip chart defines the most frequently used features of the printer. The duty-cycle monitor displays power on time, cumulative lines printed, and ribbon exhaust features via a 16-digit LCD.

Features

- Unique <Escape> Sequence Override Module
- Paper slew speed of 33 inches per second (83.8 cm per second)
- Ribbon usage monitor
- Accepts continuous fanfold paper
- Accepts carbon and carbonless multipart forms (original plus five copies)
- Long life reel-to-reel ribbon
- Fully integrated power paper stacker

Ordering Information

LP37-QA/Q3	LP37 band printer with LPV11 Q-bus controller, BC27A-30 cable. For use with BA23 and BA123 enclosures. 120/240 V
LP37-SA/S3	LP37 band printer with LPV11-SA Q-bus S-box controller, BC27L-30 cable. For use with BA2xx and VAX 4000 systems. 120/240 V
LP37-UA/U3	LP37 band printer with LP11 UNIBUS controller, BC27A-30 cable. 120/240 V
LP37-VA/V3	LP37 band printer with no controller, BC27A-30 cable for use with DECserver 250 and VAXBI systems. *Prerequisite for VAXBI systems:* DMB32 controller (not included) 120/240 V

Note: LP37 includes universal power supply; -x3 variants require a country kit from the list below.

LP37 Line Printer

Country Kits

LP37K-AD	Denmark	64-/96-character band, power cord, English operator's panel
LP37K-AE	U.K.	64-/96-character band, power cord, English operator's panel
LP37K-AG	Germany	64-/96-character band, power cord, German operator's panel
LP37K-AI	Italy	64-/96-character band, power cord, English operator's panel
LP37K-AJ	Japan	128-character Katakana, 96-character English band, power cord, English operator's panel
LP37K-AM	Sweden	64-/96-character band, power cord, English operator's panel
LP37K-AP	France	64-/96-character band, power cord, French operator's panel
LP37K-AS	Spain	64-/96-character band, power cord, Spanish operator's panel
LP37K-AV	Portugal	64-/96-character band, power cord, English operator's panel

Accessories and Supplies

For more information, see the *DECdirect* catalog.

LP37R-01	LP37 reel-to-reel ribbon (6-pack)
LP37R-02	LP37 reel-to-reel OCR ribbon (6-pack)
LP37X-AA	American 64-character band
LP37X-AC	American 96-character band
LP37X-BA	OCR-B American 64-character band
LP37X-BC	OCR-B American 96-character band
LP37X-BD	OCR-A American 96-character band

Options

DSRVP-AA/AB	DECserver 250 with license. Refer to Chapter 6, *Networks, Communications, and Cables,* for more information and software prerequisites.
QL-VZEA9-AA	VAX Vertical Forms Printing V1.0 generic license for VMS.
QA-VZEAA-Hx	VAX Vertical Forms Printing media and documentation.

Note: x denotes media type; 5 = TK50; M = magtape.

Configuring Information

Model Number	Mounting Requirements	dc Amps Drawn @			Bus Loads Drawn	I/O Panel Units
		5 V	15 V	−15 V		
LP37-UA/U3	1 quad slot	1.5	0.0	0.0	1.0	1
LP37-VA/V3	DMB32	N/A	N/A	N/A	N/A	N/A
LP37-SA/S3	1 quad slot	2.4	N/A	N/A	1.0	N/A
LP37-QA/Q3	1 quad slot		N/A	N/A		N/A

Specifications

Physical Characteristics

Height	110 cm (44 in.)
Width	79 cm (31 in.)
Depth	90 cm (35 in.)
Weight	159 kg (350 lb)

Power Requirements

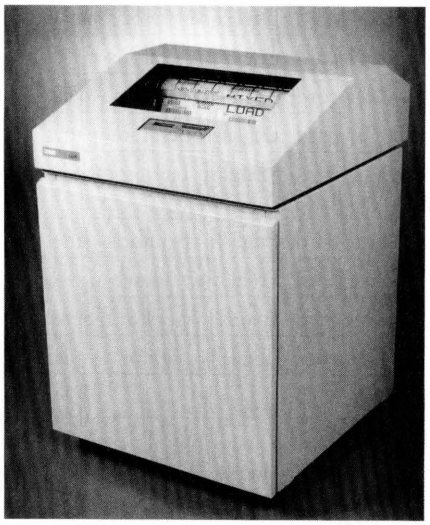
Voltage	Universal power supply
Frequency	50–60 Hz
Phases	1
Thermal dissipation (watts)	850
Thermal dissipation (Btu/h)	2900

Operating Environment

Temperature	10° to 40° C (50° to 104° F)
Relative humidity	20% to 80% noncondensing
Altitude	2.4 km (8000 ft)

For more information contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.

LG06 Shuttle-Matrix Printer



The LG06 is a 600-line-per-minute shuttle-matrix text and graphics impact printer. As a text printer, the LG06 printer offers data processing and correspondence mode printing, multiple-characters-per-inch print selections, and 7- or 8-bit character sets. In graphics mode, the LG06 printer provides up to 13 styles of barcoding including Postnet, custom forms creation, superscript and subscript, portrait and landscape mode, and many other graphics functions including sixel graphics. The LG06 is compatible with VAX VMS for text and graphics printing. UNIX systems support text printing only.

The LG06 printer's low noise level (52 dBA), small footprint, and rugged design allows placement virtually anywhere—open office, laboratory, or shop floor. It can be placed in a networked environment utilizing the DECserver 250 printer server. The LG06 printer is offered with either Data Products-style parallel interface, Centronics-style parallel interface for connection to DEC PCs or EIA-232 serial interface.

Features

- Compressed or expanded print
- Underlining, strikethrough, and bolding
- Multipart forms (1–6 parts)
- Multiple fonts
- Sparse font (800 lines per minute)
- Multiple character sets
- OCR character sets
- 7- or 8-bit character sets
- ANSI/ISO compatible
- Subscripts and superscripts
- Rotation of text for spreadsheets
- Ability to create custom forms and logos
- 13 styles of bar codes including Postnet
- LG02 compatibility
- IBM ProPrinter emulation
- Triple interfacing (EIA-232, Data Products, Centronics)
- 75,000 pages per month workload

Performance

Print Speeds	600 lines/minute (lpm) (standard) 450–800 lines/minute (lpm) (range)	
High Speed	Uppercase Upper- and lowercase	800 lpm* (maximum) 590 lpm
Data Processing	Uppercase Upper- and lowercase	600 lpm 465 lpm
Correspondence	Uppercase Upper- and lowercase	300 lpm 255 lpm
OCR-A	Uppercase Upper- and lowercase	465 lpm 380 lpm
OCR-B	Uppercase Upper- and lowercase	280 lpm 205 lpm
Barcodes and Graphics	60 × 75 dpi 100 × 100 dpi	56 inches per minute 35 inches per minute

* Using the sparse font, the LG06 printer has the ability to print with reduced dots allowing the printer to print 800 lpm.

LG06 Shuttle-Matrix Printer

Ordering Information

LG06-AA/AB	UNIBUS parallel text and graphics printer with LP11 controller, BC27A-30 30-ft (9.1-m) data cable; 120/240 V.
LG06-BA/BB	Q-bus (MicroPDP-11 and MicroVAX II) parallel text and graphics printer with LPV11 controller, BC27A-30 30-ft (9.1-m) data cable. For use with BA23 or BA123 enclosures; 120/240 V.
LG06-CA/CB	Parallel text and graphics printer with BC27A-30 30-ft (9.1-m) data cable for use with DECserver 250 and VAXBI systems. *Prerequisite for VAXBI systems:* DMB32 controller (not included); 120/240 V.
LG06-DA/DB	Serial 600-line/minute text and graphics printer for connection to EIA-232 serial interface. Includes 25-ft (7.6-m) BC22D-25 cable; 120/240 V.
LG06-EA/EB	Parallel text and graphics printer with LPV11-SA dual-ported controller, BC27L-30 30-ft (9.1-m) data cable, for use with BA2xx or VAX 4000 enclosures; 120/240 V.
LG06-JA/JB	Parallel text and graphics printer with 30-ft (9.1-m) BC27L-30 data cable to be used as a second printer connected to an LG06-EA LPV11-SA controller. *Prerequisite:* LG06-EA; 120/240 V.
LG06-PA/PB	Text and graphics printer with Centronics-type BC19M-10 10-ft data cable for use with DEC personal computers; 120/240 V.

Note: 240-V variants require the purchase of a country-specific power cord:

BN02A-2E	United Kingdom/Ireland
BN03A-2E	Austria/Belgium/Finland/France/Germany/Netherlands/Norway/Portugal/Spain/Sweden
BN04A-2E	Switzerland
BN05A-2E	Australia/New Zealand
BN06A-2E	Denmark
BN07A-2E	Italy
BN18L-2E	Israel

Accessories and Supplies

LXYXX-RB	Ribbons (6/box)

Options

DSRVP-AA/AB	DECserver 250 with license. Refer to Chapter 6, *Networks, Communications, and Cables,* for more information and software prerequisites.
QL-VZEA9-AA	VAX Vertical Forms Printing V1.0 generic license for VMS
QA-VZEAA-Hx	VAX Vertical Forms Printing media and documentation

Note: x denotes media type; 5 = TK50; M = magtape.

Configuring Information

Model Number	Mounting Requirements	dc Amps Drawn @			Bus Loads Drawn	I/O Panel Units
		5 V	15 V	−15 V		
LG06-AA/AB	1 quad slot	1.5	0.0	0.0	1.0	1
LG06-BA/BB	1 quad slot	1.5	0.0	0.0	1.0	1 A
LG06-EA/EB	1 quad slot	1.5	0.0	0.0	1.0	N/A
LG06-JA/JB	1 quad slot	1.5	0.0	0.0	1.0	N/A

LG06 Shuttle-Matrix Printer

Specifications

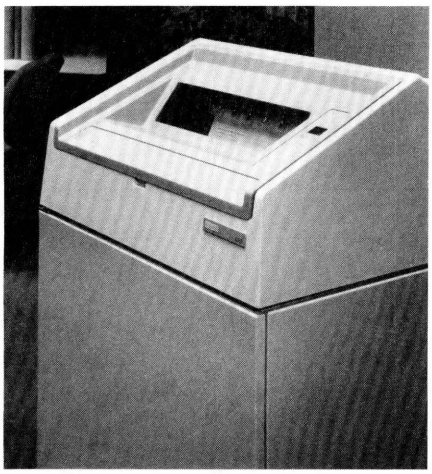
Physical Characteristics	
Height	103 cm (40.6 in.)
Width	69 cm (27 in.)
Depth	73 cm (28.7 in.)
Weight	102 kg (225 lb)

Power Requirements		
Voltage	120 V	240 V
Frequency	47–63 Hz	47–63 Hz
Phases	1	1
Current ac amps (maximum)	8	4
Thermal dissipation (watts)	1000	1000
Thermal dissipation (Btu/h)	1000	1000
NEMA receptacle type	5-15R	

Operating Environment	
Temperature	10° to 40° C (50° to 104° F)
Relative humidity	10% to 90%
Altitude	2.4 km (8000 ft)

For more information contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.

LG31 Dot-Matrix Line Printer



The LG31 is a low-end, distributed data-processing system printer. It prints at speeds up to 300 lines per minute in uppercase data-processing mode and provides extended text, bar code, and sixel processing capabilities and can be used in the open office environment; it has an acoustic level of (55 dBA). The LG31 is connected to the host CPU via a serial EIA-232 interface or in a network environment utilizing a terminal server or the DECserver 250 network server for printers.

VAX vertical forms printing is available for improved productivity in VFU applications with the LG31 printer in the VAX VMS environment.

Features

- Compressed or expanded print
- Underlining, bolding, superscript, subscript
- Multipart forms (1 to 6 parts)
- 7- or 8-bit character sets and addressing, ANSI/ISO compatible
- Front control panel
- Universal power supply

Ordering Information

LG31-A2/A3	300-li/min enhanced text line dot-matrix impact line printer with 25-ft (7.6-m) cable (BC22D-25). -A2 = 120 V, includes power cord; -A3 = 240 V, requires country kit

An EIA-232 port is required to connect the LG31 to the system. If no EIA-232 port is available, order an EIA-232-to-MMJ adapter, **H8575-A,** and one null modem MMJ serial cable, **BC16E-xx** (refer to Chapter 6, *Networks, Communications, and Cables,* for available lengths).

Country Kits

Note: A country kit must be ordered as a separate no-charge item for LG31-A3. Each country kit includes power cord, serial cable (25 feet), installation/operator manual, and user guide.

LGK31-AD	Denmark
LGK31-AE	U.K./Ireland
LGK31-AG	Germany/Austria
LGK31-AI	Italy
LGK31-AJ	Japan
LGK31-AK	Switzerland
LGK31-AT	Israel
LGK31-AZ	Australia
LGK31-CA	Belgium/Finland/France/Netherlands/Norway/Portugal/Spain/Sweden
LGK31-BJ	India
LGR31-01	50 million character cartridge nylon ribbon (1/box).

Options

DSRVP-AA/AB	DECserver 250 with license. Refer to Chapter 6, *Networks, Communications, and Cables,* for ordering information and software prerequisites.
QL-VZEA9-AA	VAX Vertical Forms Printing V1.0 generic license for VMS.
QA-VZEAA-Hx	VAX Vertical Forms Printing media and documentation.

Note: x denotes media type: 5 = TK50; M = magtape.

Specifications

Physical Characteristics	
Height	116.8 cm (46.0 in.)
Width	73.7 cm (29.0 in.)
Depth	103.2 cm (40.6 in.)
Weight	172.3 kg (375 lb)

Power Requirements		
Voltage	100 V	240 V
Frequency	50–60 Hz	50–60 Hz
Phases	1	1
Thermal dissipation (watts)	400	
Thermal dissipation (Btu/h)	1,368	
NEMA receptacle type	5-15P	

Operating Environment	
Temperature	10° to 40° C (50° to 104° F)
Relative humidity	10% to 90% maximum
Altitude	2.4 km (8000 ft)

For more information contact the EIC Sales Support Center, 800-832-6277 or 603-884-8990.

DECprint Printing Services for VMS

SPD: 32.41
UPI: YNC

DECprint Printing Services for VMS V4.1 is a layered product used with VMS systems running VMS V5.3 or greater to access and control Digital PostScript printers. This software is an update to the Version 4.0 software, which replaced two products: VAX ScriptPrinter software (which supported LN03R and LN03Q printers) and VAX PrintServer Client Software for VMS (which supported the PrintServer 40, PrintServer 40 *Plus,* and PrintServer 20 laser printers). Users of VMS prior to V5.3 require VAX PrintServer Client software to support PrintServers.

DECprint Printing Services for VMS supports the following Digital printers:

- DEClaser 1150 (LN07R)
- DEClaser 2150 plus (LN05R)
- DEClaser 2250 plus (LN06R)
- DEClaser 3250 (LN08R)
- PrintServer 20
- *turbo* PrintServer 20
- PrintServer 40
- PrintServer 40 *Plus*
- ScriptPrinter (LN03R)
- LN03 Image Printer (LN03Q)
- LF01R Colormate PS

The DECprint Printing Services product includes the following major components:

- A print symbiont that processes print requests from the host on which it resides.
- Distribution software to transmit the request and associated data over the Ethernet to a remote PrintServer via DECnet.
- Translators to convert selected data types to PostScript (ANSI, HP/PCL Level 4, ReGIS, Tektronix 4010/4014, and DDIF bitonal image files).

DECprint Printing Services for VMS must be installed on each VMS CPU or a single CPU within a cluster that will be sending print jobs directly to a PostScript printer.

Features

- Supports printing in a heterogeneous environment (VMS and PCs networked via PCSA Services for VMS). Printers can be accessed from a variety of hosts including PCs (MS-DOS, OS/2, Macintosh), workstations, and traditional VMS time-sharing terminals.
- Provides "lay-up" feature which prints multiple logical page images on one side of a sheet of paper (number-up or N-up), or to offset page images for appropriate margins when binding or hole-punching.
- Online help command provides all print commands unique to the product.
- A collection of optional ALL-IN-1 scripts and a WPS-PLUS printer table file that enhances the compatibility between ALL-IN-1, WPS-PLUS, and Digital PostScript printers. ALL-IN-1/WPS-PLUS users can access the unique features of these printers, such as duplex printing, from within the application print menus. LN03 font cartridge emulation via DEClaser soft font kits is also provided.
- PostScript tools including a kit for facilitating the Apple LaserWriter printer files and other tools that facilitate customization of the software.

Ordering Information

QL-YNCA9-AA	Traditional license (included with PrintServers)
LNXX-R	Traditional license (included with DEClasers)
QA-YNCAA-Hx	Media and documentation; x denotes media: 5 = TK50, M = magtape
QT-YNCAx-xx	Software Product Services
EK-TPS20-RC	User feature card

DEC PrintServer Supporting Host Software for VMS

SPD: 27.68
UPI: 798

DEC PrintServer Supporting Host Software for ULTRIX

SPD: 30.85
UPI: VVZ

DEC PrintServer Supporting Host Software V4.0 is a layered product that enables suitably configured systems in a DECnet or TCP/IP Ethernet local area network to boot and provide management functions for PrintServer 20, *turbo* PrintServer 20, PrintServer 40, and PrintServer 40 *Plus.*

PrintServer Supporting Host software consists of the following components:

- Primary boot image which is downloaded into the PrintServer upon receipt of a boot request.
- Management component which includes support for PrintServer configuration files, downloading of secondary boot files, and remote storage of event log and accounting files.
- Console component which allows management and monitoring of a printer from a terminal or terminal window.
- PrintServer component which is downloaded into the PrintServer. It includes DECnet and Internet distribution services, remote console services (also local console client for the PrintServer 40 and PrintServer 40 *Plus* and local panel services for the PrintServer 20 and *turbo* PrintServer 20), and the PostScript interpreter. The interpreter processes PostScript commands and generates imaging data for the printer controller.

PrintServer console clients are available for all PrintServers through a command-line interface at selected terminals on the supporting host or at the local PrintServer consoles for the PrintServer 40 and PrintServer 40 *Plus.* The console services enable the system manager to monitor the status of the PrintServer. PrintServer 20 and *turbo* PrintServer 20 have a front panel with a 2 × 24 LED display which provides PrintServer information. The front panel status messages can be displayed in English, French, German, Dutch, Swedish, or Norwegian.

Events logged by the PrintServer range from successful completion of jobs to fatal errors. These events can be displayed on remote console terminals and are displayed on the local console of the PrintServer 40 *Plus;* a subset of similar event messages are displayed on the front panel of the *turbo* PrintServer 20. Events can also be recorded in an event log file on the supporting host. A separate event log file is maintained for each PrintServer managed by the supporting host software. The PrintServer communicates with the management client component running on the supporting host which writes to the event log. Each PrintServer can send the logging data to supporting hosts.

(Continued)

DEC PrintServer Supporting Host Software for ULTRIX *(Continued)*

The PrintServer's accounting utility provides the system manager with a convenient way to monitor printer usage of a PrintServer and bill for printer usage. As with event logging data, accounting information can be sent to multiple supporting host systems on the network. The accounting utility is provided to prepare each PrintServer's usage report on a per-user-basis. Information captured includes user name (including client system), total number of sheets/sides printed, accounting by tray, and PostScript CPU time used (in seconds). In addition, the system manager can specify cost (per sheet, per side, or per seconds of CPU time); the utility also allows for accounting to begin from a specific date.

The PrintServer's client access feature provides the system manager with a convenient way to control all access to a PrintServer. Printing restrictions to a PrintServer are specified by either "allowing" or "denying" access to a PrintServer. The allow command adds DECnet area numbers or node addresses and Internet addresses, networks, or subnet numbers to the list of nodes or areas that are allowed to communicate with the PrintServer system.

The deny command adds DECnet area numbers or node addresses and Internet hosts or network numbers to the list of nodes or areas that are not allowed to communicate with the PrintServer system. Access restriction applies not only to print clients, but to management and console clients as well.

Ordering Information

QA-798AA-Hx	VMS media and documentation
QA-VVZAA-Hx	ULTRIX media and documentation

VAX Distributed Queuing Service (DQS)

SPD: 28.80
UPI: VEN

VAX Distributed Queuing Service (DQS) uses DECnet to extend the standard VMS queue system that enables users to print files on output devices attached to their local VMS node. VAX DQS enables users to print jobs on printers connected to systems other than their own, show the status of jobs on those systems, cancel their jobs from those systems, and change the specifications of their jobs on those systems.

Any node where a print request originates is called a client. Any node with an attached printer that performs the printing is called a server. Any node with VAX DQS can be configured to operate as only a client or as both a client and a server. VAX DQS does not limit the number of client or server nodes or queues. The system manager creates the queues and establishes the correspondence between client queues and queues on server nodes. A queue on a server node can accept jobs from queues on multiple client nodes. Finally, a server node can be a client to another DQS server node, which is a convenient feature when printers are temporarily out of service.

Ordering Information

Refer to SPD or complete ordering information and prerequisites.

QL-VENA9-xx	Cluster license
QA-VENAA-H5	Media (TK50) and documentation
QA-VENAA-HM	Media (magtape) and documentation

PrintServer Client Software for ULTRIX

SPD: 30.86
UPI: VVM

PrintServer Client Software for ULTRIX is a layered product that enables suitably configured ULTRIX or UNIX systems to communicate within an Ethernet network to access a PrintServer and to use the printing and accounting services available.

PrintServer Client software consists of the following components:

- Print daemon filters to process print requests from one or more printer queues.
- Network software to transmit the print request and associated data over the Ethernet to a remote PrintServer printer via Internet (TCP/IP) protocols.
- Event logging which captures error and status information.
- Centralized and local accounting for tracking printer usage.
- Online manual pages providing help for the user.
- Complete installation instructions.
- Translators to convert ANSI text and sixel graphics, ASCII, ReGIS, and Tektronix 4010/4014 files into the PostScript language.

PrintServer Client Software for ULTRIX must be installed on each system that prints directly to the PrintServer printer or provides distributed printing services for other systems (remote spooling). Systems using ULTRIX V4.0 or later do not require this client software; it has been bundled with the operating system.

Ordering Information

Refer to SPD 30.86 for complete ordering information and prerequisites.

VAX PrintServer Client Software

SPD: 27.67
UPI: 797

VAX PrintServer Client Software is a VMS layered product that enables suitably configured VMS systems within a DECnet Ethernet network to access the PrintServer 20, *turbo* PrintServer 20, PrintServer 40, and PrintServer 40 *Plus*.

The client software consists of a print symbiont and distribution software; translators to convert ANSI text and Sixel graphics, ReGIS, and Tektronix 4010/4014 files into PostScript language; and a series of PostScript tools for creator software support. These tools include a PostScript error handler, font metric files and font encoding vectors for the ISO Latin Alphabet Number 1 (ISO 8859/1), and Digital Multinational Character Set for all of the built-in PostScript fonts.

VAX PrintServer Client Software must be installed on each system running VMS operating system V4.7–V5.2 that will be providing direct printing services to the PrintServer printer or distributed printing services for other systems. A system running the VAX PrintServer Client software can transmit print requests directly to any PrintServer on the network that is defined in its network database.

Ordering Information

QA-797AA-Hx	Media and documentation
QA-797AA-GZ	Documentation only

DECprint Utility for PostScript to Sixel Printing for VMS

SPD: 31.56
UPI: YZP

DECprint Utility for PostScript to Sixel Printing for VMS (also known as DECprint Utility) is a software product that extends the capabilities of Digital printers by allowing PostScript files to be printed to sixel printers. It also provides users with a low-cost solution to the problem of printing color PostScript files.

Any current Digital graphics printer can print PostScript files, attached directly to a VAX, remotely via DECnet, or to printers attached to remotely located terminals and PCs.

DECprint Utility software enables printing of PostScript files to remote locations or when the confidentiality and convenience of a personal printer are required.

Features

- Provides a low-cost Digital color PostScript output solution in combination with the LJ250/LJ252 Companion Color Printers, and also with the LA324 MultiPrinter
- Supports the LA70 Personal Printer, LA324 MultiPrinter, LA75/LA75P Companion Printers, LA210 Letterprinter, LN03 PLUS Laser Printer, and LJ250/LJ252 Companion Color Printers
- Expands Digital's printer capabilities by supporting PostScript printing on printers attached to terminals or shared on the network
- Is less expensive than a dedicated PostScript printer, making it ideal for low-volume PostScript printing needs
- Provides access to PostScript printing for remote locations or can print confidential information right at the desk
- Easy to install and use
- Runs on any VAX, MicroVAX, VAXstation, or VAXserver running VMS V5.1 or later

Ordering Information

QL-VZPA9-PB	Single-user license
QA-VZPAA-H5	Media (TK50) and documentation kit
QA-VZPAA-HM	Media (magtape) and documentation kit

RETOS—VAX ReGIS-to-Sixels Converter

SPD: 27.88
UPI: VEF

Software applications based on Digital's ReGIS graphics protocol are an established standard in the business, scientific, engineering, and educational fields. The VAX ReGIS-to-Sixels Converter (RETOS) makes it easier than ever for ReGIS users to enjoy fast, flexible, full-featured printing capabilities on Digital printers. RETOS is a layered VMS software product that converts ReGIS graphics files to sixel files. Sixel files created by RETOS can be printed on any one of the many popular Digital printers that support the sixel protocol, including the LJ250 and LJ252 Companion Color Printers.

Features

- Supports the following Digital printers: LA324, LA75/LA75P, LA210, LN03, and the LN03 PLUS
- Fast ReGIS-to-Sixels file conversions
- Prints up to 255 colors on the LJ250 and LJ252 Companion Color Printers
- Supports most Digital printers for high-quality graphics printing
- Supports variable sizing of ReGIS images
- Choice of portrait or landscape printing
- Ideal for shared-resource printing environments
- Also supports Digital graphics video terminals
- Enhanced font output specific to printer resolutions
- Optimizes output resolution to each supported printer
- Provides flexibility and user control through optional conversion parameters
- Through RETOS, many third-party application packages that support ReGIS can output to Digital's printers
- Available in magtape, RX50 floppy disk, or TK50 tape

Ordering Information

QL-VEFA9-**	Traditional license
QA-VEFAA-H5	Media (TK50) and documentation kit
QA-VEFAA-HM	Media (magtape) and documentation kit

Refer to SPD 27.88 for complete ordering information and prerequisites.

DECfonts Typeface Collection for VMS and ULTRIX

SPD: 33.50
UPI: YX4

DECfonts Typeface Collection for VMS AND ULTRIX provides applications with a library of PostScript Type 1 Typefaces by Adobe Systems Inc. These are the first optional scalable typefaces for Digital's PostScript platforms; they can be used on any PostScript language imaging device including PostScript printers, Display PostScript software, or host-based PostScript software interpreters. DECfonts Typeface Collection includes a consolidated distribution media containing a number of typeface kits. The first release of the DECfonts Typeface Collection includes one kit, the Apple LaserWriter emulation kit, and the additional typefaces necessary to give Digital PostScript printers complete compatibility with LaserWriters. LaserWriter emulation kit contains the following typeface families: Palatino, ITC Bookman, Helvetica Narrow, ITC Zapf Chancery Medium Italic, and ITC Zapf Dingbats. Palatino, ITC Bookman, and Helvetica Narrow are available in upright, slanted, upright bold, and slanted bold versions.

Adobe's Type 1 Typefaces contain outlines, font metrics, and screen bitmaps. The outline description of the typeface characters used by the printer are contained in the printer font files. This outline description is scalable and device independent. Scalability allows the typeface to be printed in any point size supported by the application. Device independence means the characters can be reproduced on any PostScript language device. The font metric files contain information on size and shape characteristics of the font. This includes data that may be required by application programs in determining the spacing between characters (kerning) and the spacing between lines (leading). Screen bitmaps of corresponding sizes can be used by applications to provide WYSIWYG (What You See Is What You Get) video displaying of documents.

(Continued)

DECfonts Typeface Collection for VMS and ULTRIX *(Continued)*

Features

- Optional PostScript Type 1 Typeface outlines can be used by PostScript software interpreters such as Display PostScript software, PostScript printers or the DECprint Utility for PostScript to Sixel printing.
- Incorporates matching screen bitmaps for both 75 and 100 dot/inch video displays in a number of standard DECwindows sizes (10, 12, 14, 18, and 24 points) for WYSIWYG screen representation. The LaserWriter emulation kit also includes 8 points.
- Associated font metric files used by formatting software such as DECwrite and DECpresent.

Ordering Information

QL-YX499-PB	DECfonts LaserWriter emulation kit (single-user license)
QA-YX6AA-Hx	DECfonts for VMS media and documentation
QA-YX6AB-Hx	DECfonts for ULTRIX media and documentation

Note: x denotes media type; M = magtape, 5 = TK50.

SoftFont

SoftFont is a series of bitmap fonts emulating the font capabilities of the LN03 and DEClaser 2100 plus and 2200 plus printers. Any of Digital's PostScript printers that operate under DECprint Printing Services software V4.0 or higher can use SoftFont.

The standard SoftFonts are available on TK50 or 9-track magtape media. Installed and specified through VMSINSTAL, they are further specified through an extension to the standard VMS PRINT command. The fonts are then available to all ANSI documents such as those produced by WPS-PLUS and printed under DECprint Printing Services to a Digital PostScript printer.

Prerequisites

DECprint Printing Services Software V4.0 or higher.

Ordering Information

LNSFT-Ax	CG Times 8, 10, 12 CG Times 14, 18 CG Times 24
LNSFT-Bx	CG Triumvirate 8, 10, 12 CG Triumvirate 14, 18 CG Triumvirate 24
LNSFT-Cx	ITC Souvenir 8, 10, 12 English Embassy 14, 18
LNSFT-Dx*	Mono Swiss 14, 18 Mono Swiss 24 Letter Gothic 10, 14 OCR-A, OCR-B 10 Barcode 3 of 9, 18, 36 U.S. Legal

Note: x denotes media type; M = magtape, 5 = TK50

* Does not include U.S. Legal Gothic

VAX Vertical Forms Printing

VAX Vertical Forms Printing for VMS (VAX VFP) is an online software utility designed for users who want to take advantage of the Vertical Forms Unit (VFU) capabilities of the printers listed in the *Systems Support Addendum* (SSA 31.26) (LG31, LG01, LP37, and LP29). VFU controls the vertical motion of the paper, which enables faster throughput.

VFP provides DCL-like commands to set up a generic VFU load file and to convert generic load and data files into device-specific load and data files. A generic VFU load file describes the format of the page. The page format is described by specifying the line numbers and the channel numbers associated with the line.

To order VAX VFP the UPI is VZE. Refer to SPD 31.26. For more information, call the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

Documentation and Publication Management (DPM)

DPM allows users to print high-mix documentation retrieved from an electronic database at high speeds in a production environment. It consists of four subsystems.

The Scanning Subsystem provides for the creation of electronic files through the use of a duplex high-speed scanner with speeds of up to 50 impressions per minute (CCITT G4.2).

The Image Editing Subsystem provides manipulation and pixel-level editing of page images retrieved from either the Scanning or the Processing and Storage Subsystem.

The Printing Subsystem provides hard-copy output. A Kodak 1392 LED printer is driven by a VAX-based print controller permitting operation at 92 pages/minute for any mix of documents or images.

The Host Processing and Storage Subsystem allows scanned documents to be stored on a combination of magnetic disks (up to 126,000 pages of archival storage) and WORM DRIVES (up to 75,000 pages of magnetic disk storage). It also provides high-speed conversion of electronically created documents into image from PostScript, ASCII, Sixel and others.

Ordering Information

DPM is available by custom quote only. For additional information, contact the EIC Sales Support Center at 800-832-6277 or 603-884-8990.

ON-TAP—Bar Code Printing Software

ON-TAP software enables users to print bar codes anywhere in a document by placing a mark at each position where a bar code is to be printed. Because ON-TAP software is application-independent, the information that is marked for bar coding can be part of a letter produced by word processing software, information from an accounting program, or part of virtually any off-the-shelf program or custom-written application. ON-TAP software prints the following symbologies: Code 39, Codabar, Code 128, Interleaved 2 of 5, Straight 2 of 5, MSI, UPC, and EAN.

One of ON-TAP software's greatest features is its intrinsic ease of use. No programming or technical expertise is required. Once ON-TAP is installed on the system and a symbology is selected, bar codes can be printed anywhere on a page by simply entering a tilde (~) character at the beginning and the end of the data which is to be bar coded.

(Continued)

ON-TAP—Bar Code Printing Software *(Continued)*

Features

- Ability to print the most commonly used bar code symbologies
- Available for VMS systems, DECstation 200/300 personal computers, and PCSA local area networks
- Easy to change bar code height, ratio, plot density, and use of check digits
- Supports LA324 MultiPrinter, LA75/LA75P Companion Printers, LA210 Letterprinter, LN03 PLUS desktop laser printer, and LJ250/LJ252 Companion Color Printers, LA70 Personal Printer, and the DEClaser family
- Supports the ScriptPrinter, PrintServer 20, and the PrintServer 40 *Plus* in ANSI mode

Ordering Information

QB-GADAD-WB	ON-TAP/DOS (5.25-inch floppy disk)
QB-GADAD-WA	ON-TAP/DOS (3.5-inch floppy disk)
QB-GADAV-WG	ON-TAP/VMS MicroVAX (TK50)*
QB-GADAV-WH	ON-TAP/VMS MicroVAX (magtape)*
QB-GADAV-WL	ON-TAP/VMS VAX 4xxx (TK50)
QB-GADAV-WM	ON-TAP/VMS VAX 4xxx (magtape)
QB-GADAV-WA	ON-TAP/VMS VAX 6xxx (TK50)
QB-GADAV-WB	ON-TAP/VMS VAX 6xxx (magtape)
QB-GADAV-WC	ON-TAP/VMS VAX 7xx (TK50)
QB-GADAV-WD	ON-TAP/VMS VAX 7xx (magtape)
QB-GADAV-WE	ON-TAP/VMS VAX 8xxx (TK50)
QB-GADAV-WF	ON-TAP/VMS VAX 8xxx (magtape)
QB-GADAV-WJ	ON-TAP/VMS VAX 9xxx (TK50)
QB-GADAV-WK	ON-TAP/VMS VAX 9xxx (magtape)

* MicroVAX order numbers include the MicroVAX II, MicroVAX 2000, and MicroVAX 3000 series.

LaserTwin Version 5.0 Software—HP LaserJet Series III Emulation

LaserTwin Version 5.0, from Metro Software, Inc., is a memory-resident MS-DOS software package for use with Digital's laser, dot-matrix, and ink-jet printers. It provides Hewlett-Packard LaserJet Series III emulation, with the exception of the HP-GL/2 plotter language. LaserTwin Version 5.0 permits use of scalable fonts, graphics, and other features of the HP LaserJet III while printing with a Digital printer. Professional-looking documents can be created with fonts scalable from 1 to 1,000 points.

It is a low-cost software solution for Digital users who have MS-DOS PCs and need LaserJet III capabilities. With LaserTwin Version 5.0, users can print from virtually all PC software using Digital printers.

Features

- HP LaserJet Series III emulation for Digital's printers
- Support for all popular PC software packages through their HP LaserJet III drivers
- All HP LaserJet III internal fonts, scalable from 1 to 1,000 points
- Ability to use Metro's SuperFonts 25/1 or other soft font equivalents with programs that require a particular HP font cartridge
- Non memory-resident version (for batch processing)
- 5.25- and 3.5-inch disks

Ordering Information

QB-GGHAD-WA	LaserTwin (Version D) software for the DEClaser family, LN03, and LN03 PLUS printers
QB-YZRAD-WA	LaserTwin (Version A) for the LA70, LA75, LA75P, LA210, LJ250, LJ252, and LA324 printers

Prerequisites

- DECstation PC family; IBM PC XT, AT, PS/2, or compatible
- DOS V3.0 or above
- 29-Kbytes PC RAM memory
- 1-Mbyte disk space
- 1 RAM cartridge recommended for soft font

SuperFonts 25/1

SuperFonts 25/1 offers 25 of Hewlett-Packard's popular A–Z font cartridges for use with Digital's DEClaser family of printers and LaserTwin software. This package includes portrait and landscape orientation of Helvetica, Times Roman, Times Math, Courier, Presentation, Prestige Elite, Letter Gothic, Tax Line, Draw, PC Line, or even OCR and UPC for product codes. Use with LaserTwin to make a DEC printer HP compatible.

Features

- Contains all HP font cartridges in one software package
- Easy to install; menu-driven
- Over 139 fonts, all HP symbol sets, 14 type families and over 11 type sizes
- Compatible with most popular software programs

Ordering Information

Q6VS4-CZ	SuperFonts 25/1

Freedom of Press

Freedom of Press software turns an ordinary printer into a PostScript language compatible device. It can create text and graphics from a Macintosh to LA75, LJ250, LN03 PLUS, DEClaser 2100 plus, and DEClaser 2200 plus printers. Complete with 35 outline fonts equivalent to those found on an Apple LaserWriter Plus, it provides the capability to scale and rotate these typefaces to arbitrary point sizes and angles. Freedom of Press software can also be used to turn a Macintosh into a print server for use by anyone in the network.

Prerequisites

Macintosh Plus, SE, SE30, II, IIcx, IIci, IIfx, portable, or any Macintosh with math coprocessor; 2 Mbytes of memory; application software that generates PostScript language output.

Ordering Information

QB-GJKAM-WA

Reggie Software—Mac Graphics Files Converter

Reggie software is a Macintosh application that converts Macintosh-format graphics files into Digital-format graphics files. Reggie software converts the Macintosh-format graphics files into either ReGIS or sixel files for use with any of Digital's dot-matrix printers, such as the LA324 MultiPrinter, LA75/LA75P Companion Printers, and the LA210 Letterprinter; Digital's DEClaser family of printers; and the LN03 and LN03 PLUS printers. Reggie software also provides a low-cost solution for those requiring ReGIS or sixel printing capabilities on Digital's LJ250/LJ252 Companion Color Printers.

The resulting ReGIS or sixel files can be shared with anyone connected to the host or network. The graphics files can be viewed on any graphics terminal, such as the VT330$^+$ or VT340$^+$ terminals.

Features

- Define output devices as sixel or ReGIS
- Adjust the size and position of the image
- Preview the conversion on an attached terminal or printer
- Retain all the original color information to print in ReGIS or sixel format
- Save converted images in files
- Supports LA324 MultiPrinter, LA75 Companion Printer, LA210 Letterprinter, the DEClaser family of printers, LN03 and LN03 PLUS desktop laser printers, and LJ250 Companion Color Printer

Ordering Information

Q6VKR-CZ	Reggie Software

PrintAPlot Software—HP Plotter Emulation

PrintAPlot is a PC software package that enables Digital laser, ink-jet, or dot-matrix printers (LN03 and DEClaser family; LJ250 and LJ252; LA210, LA75, LA70, LA75P, and LA324) to be used as high-resolution plotters. Users can double the utility of their printers by producing complicated drawings. The user selects the pen width, shading, and colors from a simple Lotus-like menu. PrintAPlot enables users to print large drawings by segmenting them over separate pages; they can then assemble them to form a complete image. PrintAPlot also allows users to reduce drawings to 1 percent of the original size. In addition, images can be rotated and positioned anywhere on a page. PrintAPlot is ideal for scientific and engineering drawings as well as business graphics. It includes a card for 3.5-inch floppy if needed.

Features

- Improved printing speeds, up to 10 times
- Improved output quality without adding memory
- Simplified reduction or enlargement of drawings
- Maximum resolution graphics for each printer
- Support for LJ250, LJ252, LA70, LA75, LA75P, LA210, LA324, LN03, LN03 PLUS, ScriptPrinter, and the DEClaser family
- Color support for LJ250, LJ252, LA324, and color simulation on monochrome printers by rendering in various shades of grey
- Works with all popular MS-DOS packages which support HP7470, 7475, Colorpro or the Digital LVP16 plotters
- Emulation is transparent to user
- Supports filing of output. Large images can be printed in sections over several pages, enabling users to recreate them by assembling the individual sheets
- Drawings can be enlarged up to 600% or reduced to 1% of full size

Ordering Information

Q6VNW-CZ	PrintAPlot Software (5.25-inch floppy disk)

JetForm Software

The JetForm Forms Development System is a set of tools for designing, developing, and completing electronic forms. Electronic forms can be used to collect, store, share, and retrieve information for every kind of form, including insurance claims, job applications, invoices, and shipping labels.

The JetForm Forms Development System provides four different, specialized products that work either alone or together, depending on user requirements. The four products are:

- JetForm Design, a forms design and fill tool based on the Microsoft Windows interface
- JetForm Filler, which provides interactive data entry on the forms created by JetForm design
- JetForm Server, a VAX VMS based server that monitors the system for new printing tasks and then locates the form, enters the data, controls the assigned laser printers, downloads the fonts, and prints the required number of completed forms
- JetForm Merge, which enables merging of variable data (from files created by host application programs) with electronic forms created with JetForm Design, and then prints the completed form

Prerequisites

Intel 386 or 486-based PC running MS-DOS V3.0 or higher, 2-Mbyte RAM minimum; hard disk, mouse, graphics monitor; JetForm server runs on VAX VMS V5.3 (or higher) or in a PC environment; Windows 3.0 or higher; Digital's PrintServer 20, *turbo* PrintServer 20, PrintServer 40 Plus, DEClaser 1150, DEClaser 2150 plus, DEClaser 2250 plus, DEClaser 3250, LN03 ScriptPrinter, and ColorMate PS. Digital's PATHWORKS PC integration software products are required to print from a PC to a PrintServer printer; JetForm server supports any MS-DOS LAN or OS/2 LAN server.

Ordering Information

QB-XBNAD-WA	JetForm Design MS-DOS 3.5-inch, 5.25-inch diskette
QB-XL6AD-WA	JetForm Filler MS-DOS 3.5-inch, 5.25-inch diskette
QB-XBPAD-WA	JetForm Server MS-DOS 3.5-inch, 5.25-inch diskette
QB-XW9AV-WE	JetForm Server VAX Class 2 TK50
QB-XW9AV-WF	JetForm Server VAX Class 3 TK50
QB-XW9AV-WG	JetForm Server VAX Class 4 TK50
QB-XW9AD-WH	JetForm Merge MS-DOS 3.5-inch, 5.25-inch diskette
QB-XW9AV-WB	JetForm Merge VAX Class 2 TK50
QB-XW9AV-WC	JetForm Merge VAX Class 3 TK50
QB-XW9AV-WD	JetForm Merge VAX Class 4 TK50

VAX Class 2: VAXstation, MicroVAX, VAX-11/725, VAX-11/730, 2000, MicroVAX 3100

VAX Class 3: DEC VAX-11/750, 78x 3xxx, VAX 4000, VAX 62xx, VAX 6320, VAX 6410, VAX 82xx/83xx/85xx/86xx

VAX Class 4: DEC VAX 6330, 6340, 6420-6460, 86xx, 87xx, 88xx, 89xx, 9xxx

Chapter 9
Software and Services

Network Application Support (NAS)

Software

Services

Network Application Support (NAS)

Overview

Network Application Support (NAS) is a set of standards-compliant software that resides above the base platform (hardware and operating system), providing a consistent interface to support applications running on different platforms. NAS-based applications allow users to access and share information across the organization, no matter where they are located or what kind of system they are using.

With NAS integrated software products, Digital is the first vendor to provide an easy, yet comprehensive approach to implementing the infrastructure needed for today's open, client/server computing environment. Much more than just a package, these integrated software products combine a set of individual components with the engineering integration necessary to ensure that a server environment is in place for various applications.

NAS 200 Integration at the Desktop

NAS 200 for VMS and NAS 200 for ULTRIX provide a complete set of networking and distributed computing capabilities for basic print, file, and data sharing services for PCs, Macintosh systems, and workstations. It is targeted for environments where applications run principally on the desktop, and where users of these applications need to share files, printers, and data.

The NAS 200 software supports key standards such as OSF's DCE/DME, OSI, TCP/IP, and NFS.

NAS 300 Distributed Client/Server Computing

The NAS 300 integrated software products for VMS and ULTRIX systems provide a complete set of runtime services for client/server, distributed, or general host-based applications. They provide integration capabilities for the interoperation and distribution of applications that run partially or totally on the server or across multiple servers or clients.

NAS 300 provides a range of application integration software for a broad range of client/server capabilities and features. These include: distributed user interface facilities, object-oriented application linking and control, support for creating multimedia documents and management of multimedia data, along with desktop integration. It supports key standards such as OSF's Motif, OMG/ORB, and SQL.

NAS 400 Ideal for Critical Large Business Operations

NAS 400 for VMS offers additional NAS and system software for environments that require higher levels of availability, manageability, and reliability for transaction processing and other business-critical applications. NAS 400 supports performance tuning and capacity planning; disk shadowing, clustering, journaling, transaction processing, application distribution and integration, and desktop integration.

NAS 250 VAXstation Integration into the NAS Environment

The NAS 250 software provides a complete set of NAS software to enable the new VAX workstations to fully integrate into a client/server or distributed environment.

The NAS 250 software supports key standards such as OSF's Motif, OSI, TCP/IP, NFS, OMG/ORB, and SQL.

Components of NAS Software Products

NAS Software for VAX Systems

NAS 400 for VMS
- DECnet VAX Full Function
- ACMS RT
- DECtrace RT
- RMS Journaling
- VAXcluster Software
- Volume Shadowing
- DECps-DC

NAS 300 for VMS
- ALL-IN-1 Mail Server (X.400)
- DEC ACA Services RT
- DECforms Runtime System
- DECmessageQ for VMS RTO
- VMS DECwindows Motif
- Rdb/VMS Runtime Option

NAS 200 for VMS
- DECnet VAX End-node
- DECnet-VAX Ext
- PATHWORKS for VMS
- PATHWORKS for Macintosh
- Remote System Mananger Client
- VMS/ULTRIX Connection (UCX)

NAS Software for DECsystems

NAS 300 for ULTRIX
- DEC ACA Services RT
- DECmessageQ ULTRIX RISC

NAS 200 for ULTRIX
- PATHWORKS for ULTRIX
- RSM Client
- DECnet/OSI for ULTRIX

NAS Software for VAXstations

NAS 250 for VAXstations
- DECnet-VAX EN
- DECnet-VAX Ext
- Rdb/VMS Runtime Option
- VMS/ULTRIX Connection (UCX)
- VAXcluster Software
- VMS DECwindows Motif
- DEC ACA Services RT

BU-3258

Ordering Information

NAS Software for VAX Systems		
	QL-MC1A*-xx	NAS 200 for VAX VMS (SPD 36.86); requires VMS V5.4-1 or later
	QL-MC2A*-xx	NAS 300 for VAX VMS (SPD 36.85); requires VMS V5.4-1 or later
	QL-MC5A*-xx	NAS 400 for VAX VMS (SPD 40.63); requires VMS V5.5 or later
NAS Software for DECsystems		
	QL-XVCA*-xx	NAS 200 for ULTRIX (SPD 36.87); requires ULTRIX V4.2 or later
	QL-XVAA*-xx	NAS 300 for ULTRIX (SPD 36.84); requires UWS V4.2 or later
NAS Software for VAXstations		
	QL-XVDA*-xx	NAS 250 for VAXstations (SPD 36.89); requires VMS V5.5 or later

NAS Optional Development Software

NAS 200 for VMS	
QL-GZRA*-AA	OSI Application Developer's Toolkit
NAS 300 for VMS	
QP-LAXAA-AA	DECwindows Motif Tools Package with:
QL-YHCA9-QB	DEC VUIT
QL-XARA9-QB	LINKWORKS Developer's Tools
QL-XAQA9-QB	DECwindows Graphical Interface Tools
QL-VCHA*-xx	DECforms
QL-XKAA*-xx	ACA Services Development
QL-GKPA9-Jx	DECmessageQ Development
QL-VD2A*-xx	Rdb/VMS Full Development
QL-VD2A*-xx	VAX Rdb/VMS
QL-VFJA*-xx	DEC Rdb Expert for VMS
QL-MEQA*-xx	DEC InstantSQL for Rdb/VMS (workstations only)
QL-GZRA*-AA	OSI Application Developer's Toolkit
QL-892A9-J*	DECimage Application Services
QL-MLTA*-xx	SQL Multimedia for Rdb/VMS
NAS 400 for VMS	
QL-079A*-xx	VAX ACMS
QL-897A*-xx	CDD/Repository for VMS
QL-VW2A*-xx	DECtrace
QL-GZRA*-AA	OSI Application Developer's Toolkit
QP-LAXAA-AA	DECwindows Motif Tools Package with:
QL-YHCA9-QB	DEC VUIT
QL-XARA9-QB	LINKWORKS Developer's Tools
QL-XAQA9-QB	DECwindows Graphical Interface Tools
QL-VCHA*-xx	DECforms
QL-XKAA*-xx	ACA Services Development
QL-GKPA9-Jx	DECmessageQ Development
QL-VD2A*-xx	Rdb/VMS Full Development
QL-VD2A*-xx	VAX Rdb/VMS
QL-VFJA*-xx	DEC Rdb Expert for VMS
QL-MEQA*-xx	DEC InstantSQL for Rdb/VMS (workstations only)
QL-892A9-Jx	DECimage Application Services
QL-MLTA*-xx	SQL Multimedia for Rdb/VMS
NAS 200 for ULTRIX	
QL-GZSA*-AA	OSI Application Developer's Toolkit
NAS 300 for ULTRIX	
QL-XKE-*-AA	ACA Services Development
QL-GZSA*-AA	OSI Application Developer's Toolkit
QL-YFAA*-AA	DECimage Application Services

* Processor code

NAS Component Hardcopy Documentation

NAS 200 for VMS	
QA-D04AB-GZ	DECnet-VAX Extensions, V5.4
QA-A93AA-GZ	PATHWORKS for VMS, V4.0
QA-YPCAA-GZ	PATHWORKS for Macintosh, V1.0
QA-B13AA-GZ	Remote System Manager, V2.3
QA-358AA-GZ	SQL/Services, V4.0
QA-VHRAA-GZ	VMS/ULTRIX Connection, V1.3
NAS 300 for VMS	
QA-D04AB-GZ	DECnet-VAX Extensions, V5.4
QA-A93AA-GZ	PATHWORKS for VMS, V4.0
QA-YPCAA-GZ	PATHWORKS for Macintosh, V1.0
QA-B13AA-GZ	Remote System Manager, V2.3
QA-358AA-GZ	SQL/Services, V4.0
QA-VHRAA-GZ	VMS/ULTRIX Connection, V1.3
QA-XKAAA-GZ	DEC ACA Services, V2.0
QA-VCHAA-GZ	DECforms, V1.3
QA-GKPAA-GZ	DECmessageQ for VMS, V1.0
QA-XA1AA-GZ	DECwindows Motif, V1.0
QA-358AA-GZ	VAX Rdb/VMS, V4.0
NAS 400 for VMS	
QA-D04AB-GZ	DECnet-VAX Extensions, V5.4
QA-A93AA-GZ	PATHWORKS for VMS, V4.0
QA-YPCAA-GZ	PATHWORKS for Macintosh, V1.0
QA-B13AA-GZ	Remote System Manager, V2.3
QA-358AA-GZ	SQL/Services, V4.0
QA-VHRAA-GZ	VMS/ULTRIX Connection, V1.3
QA-XKAAA-GZ	DEC ACA Services, V2.0
QA-VCHAA-GZ	DECforms, V1.3
QA-GKPAA-GZ	DECmessageQ for VMS, V1.0
QA-XA1AA-GZ	DECwindows Motif, V1.0
QA-358AA-GZ	VAX Rdb/VMS, V4.0
QA-079AA-GZ	VAX ACMS, V3.2
QA-VW2AA-GZ	DECtrace
QA-VBRAB-GZ	VAXcluster Software, V5.4
QA-AB2AA-GZ	Volume Shadowing, V5.4
QA-GX1AA-GZ	DECps Data Collector
NAS 200 for ULTRIX	
QA-716AA-GZ	DECnet/OSI for ULTRIX, V5.0
QA-YNGAA-GZ	PATHWORKS for ULTRIX, V1.1
QA-B13AA-GZ	Remote System Manager, V2.3
NAS 300 for ULTRIX	
QA-716AA-GZ	DECnet/OSI for ULTRIX, V5.0
QA-YNGAA-GZ	PATHWORKS for ULTRIX, V1.1
QA-B13AA-GZ	Remote System Manager, V2.3
QA-XKCAA-GZ	DEC ACA Services, V2.0
QA-GHUAA-GZ	DECmessageQ for ULTRIX, V1.0
NAS 250 for VMS	
QA-001A4-GZ	DECnet-VAX (end node), V5.4
QA-XA1AA-GZ	DECwindows Motif, V1.1
QA-D04AB-GZ	DECnet-VAX Extensions, V5.4
QA-VBRAA-GZ	VAXcluster Software, V5.4
QA-VHRAA-GZ	VMS/ULTRIX Connection, V1.3
QA-XKAAA-GZ	DEC ACA Services

Network Application Support (NAS) at a Glance

Package	Contents	Target Environments	Standards Supported
NAS 200—VMS QL-MC1A*-xx SPD 36.86	DECnet End-Node DECnet-VAX Extensions PATHWORKS for VMS PATHWORKS for Macintosh Remote System Manager Client VMS/ULTRIX Connection UCX	Desktop Integration Sharing files, printers and data Services for workstations, PCs, and Macintosh systems	OSI TCP/IP NFS LAN Manager
NAS 300—VMS QL-MC2A*-xx SPD 36.85	DECnet End-Node DECnet-VAX Extensions PATHWORKS for VMS PATHWORKS for Macintosh Remote System Manager Client Rdb/VMS Runtime Option VMS/ULTRIX Connection UCX ALL-IN-1 Mail Server (X.400) VAX ACA Services VMS RT DECforms Runtime System DECmessageQ for VMS RTO VMS DECwindows Motif	Distributed client/server computing Runtime services for feature distributed user interface facilities; object-oriented application linking and control; multimedia documents; interprocess messaging and mail; full data integration	OSI TCP/IP NFS LAN Manager SQL Motif X-windows OMG/ORB FIMS ODA X.400
NAS 400—VMS QL-MC5A*-xx SPD 40.63	DECnet Full-Function DECnet-VAX Extensions PATHWORKS for VMS PATHWORKS for Macintosh Remote System Manager Client Rdb/VMS Runtime Option VMS/ULTRIX Connection UCX ALL-IN-1 Mail Server (X.400) VAX ACA Services VMS RT DECforms Runtime System DECmessageQ for VMS RTO VMS DECwindows Motif VAX ACMS RT DECtrace RT VAX RMS Journaling VAXcluster Software Volume Shadowing DECps Data Collector	Targeted at business-critical applications Supports performance tuning, capacity planning, disk shadowing, clustering, journaling, and transaction processing	OSI TCP/IP NFS LAN Manager SQL Motif X-windows OMG/ORB FIMS ODA X.400
NAS 250—VMS QL-XVDA*-xx SPD 36.89	DECnet-VAX End Node DECnet-VAX Extensions Rdb/VMS Runtime Option VMS/ULTRIX Connection UCX VAXcluster Software VMS DECwindows Motif VAX ACA Services VMS RT	Allows workstation to fully integrate into client/server or distributed environments	OSI TCP/IP NFS LAN Manager SQL Motif OMG/ORB
NAS 200—ULTRIX QL-XVCA*-xx SPD 36.87	PATHWORKS for ULTRIX RSM Client DECnet/OSI for ULTRIX	Desktop integration Sharing files, printers, and data Services for workstations, PCs, and Macintosh systems	OSI TCP/IP NFS LAN Manager
NAS 300—ULTRIX QL-XVAA*-xx SPD 36.84	PATHWORKS for ULTRIX RSM Client DECnet/OSI for ULTRIX DEC ACA Services RT DECmessageQ ULTRIX/RISC	Distributed client/server computing Runtime services for object-oriented application linking and control and interprocess messaging	OSI TCP/IP NFS LAN Manager OMG/ORB

DEC OSF/1

SPD: 36.29
UPI: XYW

DEC OSF/1 is Digital Equipment Corporation's implementation of the Open Software Foundation (OSF) and operating system components and Motif graphical user interface and programming environment.

The DEC OSF/1 V1.0 operating system is an advanced kernel architecture based on Carnegie Mellon University's Mach kernel design with components from Berkeley Software Distribution (BSD) and other sources. DEC OSF/1 also provides realtime support and numerous features intended to assist application programmers in developing applications that use shared libraries, multithread support, and memory mapped files. In addition, to insure a high level of binary compatibility with ULTRIX, the DEC OSF/1 operating system is compatible with the Berkeley programming interfaces.

Part of the charter of the Open Software Foundation is to provide an interface for developing portable applications that will run on a variety of hardware platforms. DEC OSF/1 is compliant with the OSF Application Environment Specification (AES) that specifies the interface to support these portable applications. In addition, the DEC OSF /1 operating system complies with standards and industry specifications, including FIPS 151 1, POSIX (IEEE Std. 1003.1-1988), XPG3 BASE branding, XTI, and AT&T System V Interface Definition (SVID) Issue 2 (Base System and Kernel Extensions).

DEC SoftPC for VMS

SPD: 32.18
UPI: YNW

DEC SoftPC for VMS provides VAXstation users with the ability to operate DOS-based software. The SoftPC product emulates an IBM PC/AT system (real mode only) using standard VAX hardware and VMS software. A DOS application functions in the SoftPC environment as it functions on an IBM PC AT providing it does not require special hardware, protected mode memory or copy protected diskette.

DEC SoftPC supports DECwindows as well as the VT220. As such, it can be executed on any VMS system and displayed on a VT220 or a local or remote DECwindows X Windows display station. For example, a VAX 8600 can be used for execution and a VAXstation 2000 running the VMS operating system can act as the display. Additionally, it supports the DECwindows text cut and paste facility.

The performance of the SoftPC facility is dependent upon a number of factors as well as the speed of the processor upon which it executes. A VAXstation 3100/38 system yields slightly under 6 MHz IBM PC/AT CPU performance with arithmetic applications. Graphics applications may be slower.

Applications used with the SoftPC emulator (except those DOS utilities included with the SoftPC software) are not Digital licensed, warranted or supported products. The user must comply with the terms and conditions of each application software license agreement in effect between the user and application supplier.

Communications applications may not operate in a like manner to a real PC due to differences in signaling on the VAX processor and the PC processor and the way in which the VAX processor handles interrupts. Many communications programs do work correctly and it is recommended these programs be tried before purchasing SoftPC.

Desktop-VMS Software

SPD: 25.F4
UPI: VV8

Desktop-VMS Software is an easy-to-use VMS operating system environment, offering simplified system installation and system management.

It is delivered as a preintegrated, preinstalled VMS system on compact disc (CD) and includes the following system software components: VMS operating system, DECnet-VAX End-Node, VAXcluster software, and Desktop VMS "ease-of-use" software.

SoftPC for ULTRIX

SPD: 32.17
UPI: YP7

SoftPC for ULTRIX provides the RISC user the ability to operate DOS based software. The SoftPC product emulates an IBM PC/AT system (real mode only) using standard hardware and software. A DOS application will function in the SoftPC environment as it functions on an IBM PC/AT if it does not require special hardware, protected mode memory, or copy protected diskettes.

DEC SoftPC supports DECwindows as well as the VT220. As such, it can be executed on an ULTRIX system and can be displayed on a VT220 or a local or remote DECwindows display. Additionally, it supports the DECwindows text cut and paste facility.

The performance of the SoftPC facility is dependent upon a number of factors as well as the speed of the processor upon which it executes. A DECstation 3100 system yields somewhere between an 8 MHz AT and a 386 CPU speed. A DECstation 5000 will deliver compute performance above that of a low-end 386. Graphics performance will be slower.

Applications used with the SoftPC emulator (except those DOS utilities included with the SoftPC software) are not Digital licensed, warranted, or supported products. The user must comply with the terms and conditions of each application software license agreement in effect between the user and application supplier.

Communications applications may not operate in a like manner to a real PC due to differences in signaling on the RISC processor and the PC processor, and the way in which the RISC processor handles interrupts. Many communications programs do work correctly and it is recommended these programs be tried before purchasing SoftPC.

ULTRIX Operating System

SPD: 26.40
UPI: VEY (VAX)
VYV (RISC)

ULTRIX operating system is Digital Equipment Corporation's native implementation of the UNIX operating system for all currently supported VAX, MicroVAX, VAXstation and Digital RISC systems. The ULTRIX operating system is an interactive, demand paged, virtual memory, multiple processor, time-sharing operating system that has a hierarchical file system with dismountable volumes, compatible device and interprocess I/O, asynchronous processes, system command language selectable on a per-user basis, disk quotas, job quotas, over 200 subsystems, and a high degree of portability among processors running ULTRIX application programs.

VAX System V

SPD: 33.24
UPI: VZZ

VAX System V is Digital Equipment Corporation's implementation of UNIX System V running on VAX processors. It has been tested using the AT&T System V Verification Suite and conforms to the Base System, Kernel Extension, Terminal Interface Extension, and Network Services Extension as specified in Issue 2 of the AT&T System V Interface Definition Volumes 1, 2, and 3. VAX System V provides a high degree of compatibility and portability among systems running the UNIX System V operating system and UNIX System V application programs.

VAX System V is an interactive, demand-paged, virtual memory, time-sharing operating system including support for a Symmetric Multiprocessing (SMP) architecture. An SMP architecture is a tightly coupled multiple CPU configuration, where all processors share all of memory, execute a single copy of reentrant kernel code, and serve as peer resources to the operating system in the execution of user and kernel processes.

This version includes the following UNIX System V features: STREAMS, Transport Level Interface Library, Remote File Sharing (RFS), and Shared Libraries. Additionally, this version contains enhancements provided by Digital including STREAMS based TCP/IP networking software, cluster hardware support, Digital terminal server support (LAT), an on line system exerciser suite, and simplified system installation procedures.

VAX System V is upward compatible with previous versions of UNIX System V for VAX processors. Executable images that run on previous versions of UNIX System V for VAX processors generally run unmodified on VAX System V.

VAX-11 RSX

SPD: 26.73
UPI: 382

VAX-11 RSX is an emulator of the RSX operating system family which executes on all VAX systems. VAX-11 RSX runs in compatibility mode on processors that support a PDP-11 instruction set subset in hardware or microcode, and also runs on processors without this support by providing its own software emulation of the same PDP-11 instruction set subset.

VAXmate Software for Standalone Use

SPD: 55.06
UPI: 0M1

VAXmate Software for Standalone Use gives the user of VAXmate hardware the ability to use industry standard applications in a nonnetworked environment. It includes the MS-DOS operating system, a user interface, terminal emulation, online user information, and printer support.

Digital's adaptation of the MS-DOS operating system enables program execution, file retrieval, and editing and provides storage capabilities, disk utilities, and other system operations. MS-Windows gives the user a visual interface to the operating system through pull-down menus, dialog boxes, and icons, as well as providing the multiple program viewing capability of windowing.

OpenVMS Operating System

SPD: 25.01
UPI: 09S (Base Documentation Kit)
001 (Extended Documentation Kit)

OpenVMS operating system, is a general-purpose multiuser operating system that supports VAX, MicroVAX, VAXstation, and VAXserver series computers in both development and production environments. OpenVMS can be tuned to perform well in a wide variety of applications, including compute-intensive, I/O intensive, realtime, and combinations of those and other environments. (Actual performance depends upon the type of VAX computer, available physical memory, and the number and type of disk and tape drives on the system.)

OpenVMS has well-integrated networking, distributed computing, multiprocessing and windowing capabilities. OpenVMS contains extensive features that promote ease-of-use, improve the productivity of programmers, and facilitate system management. OpenVMS also supports a large number of industry standards, facilitating application portability and interoperability.

Users may access OpenVMS by using the English-like Digital Command Language (DCL), the command language for OpenVMS that is supplied with the system. DCL commands take the form of a command name followed by parameters and qualifiers. DCL commands provide information about the system, initiate system utilities, and initiate user programs. OpenVMS prompts users to enter required DCL parameters, making it easy for novice users to use.

DCL commands can be entered at a terminal or included in command procedures. Command procedures can be run interactively or submitted to a batch queue for deferred execution. Information on DCL and OpenVMS utilities is available through online HELP. Online HELP includes summary operational information on all aspects of system operation. A number of tools and utilities are integrated into the OpenVMS operating system.

VMS POSIX

SPD: 34.82
UPI: GXX

VMS POSIX (Portable Operating System Interface for Computing Environments) is a set of standards and draft standards that have been generated by the Institute of Electrical and Electronic Engineers (IEEE) and supported by organizations such as the International Organization for Standardization (ISO). POSIX defines a set of interface standards for various parts of an operating system. Because of the consistency they afford applications at the operating system level, the POSIX standards are an essential underpinning of open systems computing environments.

VMS POSIX is one of Digital Equipment Corporation's responses as a software vendor to the industry POSIX effort, and is a cornerstone of VMS open systems capabilities. (Digital's ULTRIX and VAXELN systems also offer support for POSIX standards.) VMS POSIX provides the capability on VMS to develop and run applications conforming to the POSIX standards.

VMS POSIX includes support for the standards and draft standards for the system application programming interface (POSIX 1003.1), shell and utilities (1003.2), and realtime programming (1003.4). POSIX 1003.1 has been approved as a final standard. POSIX 1003.2 and 1003.4 are mature drafts that are currently being considered and evaluated by the standards community.

BASEstar CIMfast for VMS

SPD: 36.31
UPI: XDB (Development)
XDC (Runtime)

BASEstar CIMfast for VMS is an application enabler that reduces development time and application complexity, while enhancing software maintainability and facilitating rapid prototyping capability.

CIMfast allows even inexperienced BASEstar application developers to create BASEstar applications quickly.

CIMfast provides a very high level event-driven language called the CIMfast Event Language (CEL) that is especially suited for describing highly asynchronous BASEstar interaction.

BASEstar for VMS

SPD: 33.17
UPI: YU9 (Development)
YUA (Runtime)

BASEstar for VMS software facilitates the integration of manufacturing applications with plant equipment, accelerates development of integrated manufacturing systems, and provides an architecture for consistent development of manufacturing applications. BASEstar software has features for manufacturing application integration, device connection and control of plant equipment, and storage and management of device and operator files through its library system.

BASEstar software operates in a distributed VAX processing environment. Its application integration features include: the ability to collect, manage, and distribute plant data, automatically notify applications of critical changes in plant information, and synchronize execution of manufacturing applications. BASEstar software's distributed capabilities allow globally-defined objects to be utilized by applications residing on different nodes in a BASEstar network.

BASEstar device integration software gives generic device access and control for plant equipment through an interface that is independent of device-specific operations and protocols. BASEstar device connection management software is dependent on equipment level communication achieved through BASEstar device access software (DAS), allowing data to be obtained through standard mechanisms and made available throughout the BASEstar network. BASEstar device connection management capabilities can also be used to start and stop device operations, upload from and download to the memory of programmable devices, and other standard functions offered by industrial control devices.

BASEstar library management software provides BASEstar users with a mechanism for storing and tracking file development, controlling access to files, and transferring files to and from devices. The BASEstar library system can track a file from its development stage through testing and production to the archive stage while providing a history of files changes. Through its ability to control distribution of files, the BASEstar library can prevent an outdated control program from running in production.

CDA Converter Library for ULTRIX

SPD: 31.30
UPI: VZB (VAX)
YG9 (RISC)

CDA Converter Library for ULTRIX allows users of document and table data files to convert to and from a variety of other standard document and table file formats. The CDA Converter Library adds a broader set of supported formats to the file conversion facility that is a part of ULTRIX. CDA Converter Library for ULTRIX supports DECwindows workstations and timesharing systems.

The user interface provided by the ULTRIX shell and DECwindows application programs, such as DECwrite or DECdecision, remains the same, except that more formats are available. Available formats are document, table data, and graphics converters.

Converters in the CDA Converter Library do not perform modality conversions. Converters that support compound formats can process text, graphics, and images in input data, but output formats specified by users limits the conversion process. The bidirectional AFS format converter can be used to utilize an ASCII editor to edit a compound document.

CDA Converter Library for VMS

SPD: 31.31
UPI: VZA

CDA Converter Library for VMS allows users of document and table data files to convert to and from a variety of other standard document and table file formats. The CDA Converter Library adds a broader set of supported formats to the file conversion facility that is a part of VMS with VMS DECwindows.

The CDA Converter Library for VMS supports both DECwindows workstations and timesharing systems with the DECwindows Compute Server installed. The user interface provided by DCL and by DECwindows application programs such as DECwrite or DECdecision remains the same, except that more formats are available.

DEC ACA Services for ULTRIX

SPD: 36.07
UPI: XKC (VAX development)
XKD (VAX runtime)
XKE (RISC development)
XKF (RISC runtime)

DEC ACA Services for ULTRIX is an implementation of Digital Equipment Corporation's Application Control Architecture. It consists of platform independent software services that address the interaction of independently developed applications across different computing environments.

DEC ACA Services for ULTRIX provides application developers and system integrators with a set of software services for integrating independently developed applications and services across a distributed environment. Facilities are provided for registering, installing and invoking applications, and for handling interapplication communication and interaction among VMS and ULTRIX computing environments.

An object-oriented model is used to define applications to DEC ACA Services for ULTRIX Runtime system allowing sharing and re usability of application definitions. However, applications do not have to be written using object-oriented programming techniques or data storage.

DEC ACA Services for ULTRIX is based on a client/server model. A client is defined as any process or application requesting an application invocation via the ACA Services procedure call. A server is defined as the process that fulfills the request.

DEC ACA Services for VMS

SPD: 36.06
UPI: XKA (Development)
XKB (Runtime)

DEC ACA Services for VMS is an implementation of Digital's Application Control Architecture. It consists of platform-independent software services that address the interaction of independently developed applications across different computing environments.

DEC ACA Services for VMS provides application developers and system integrators with a set of software services for integrating independently developed applications and services across a distributed environment. Facilities are provided for registering, installing and invoking applications, and for handling interapplication communication and interaction among VMS and ULTRIX computing environments.

An object-oriented model is used to define applications to DEC ACA Services for VMS Runtime system, allowing sharing and re-usability of application definitions. However, applications do not have to be written using object-oriented programming techniques or data storage.

DEC ACA Services for VMS is based on a client/server model. A client is defined as any process or application requesting an application invocation via the ACA Services procedure call. A server is defined as the process that fulfills the request.

DEC Ada

SPD: 21.41
UPI: GZQ

DEC Ada is Digital Equipment Corporation's implementation of the Ada programming language, hosted and targeted for Digital RISC systems running the ULTRIX operating system.

DEC Ada conforms fully to the Ada language definition standard, ANSI/MIL STD-1815A-1983. As a result of meeting the ANSI standard, DEC Ada also conforms to the Federal Information Processing Standard (FIPS-119) and the International Standards Organization (ISO/8652-1987) standards for the Ada programming language.

DEC Ada generates highly optimized code across multiple units. All ULTRIX services and utilities are available to programs written in DEC Ada. In addition to standard Ada I/O packages that access ULTRIX standard file utilities, DEC Ada I/O is able to access files that Ada cannot open, such as inherited files and pipes.

The DEC Ada program library manager provides a number of features that allow Ada library units to be linked with foreign object files and object libraries. The program library manager can link programs consisting of either Ada or foreign main programs and either Ada or foreign subprograms.

Ada is a powerful, general purpose language that supports many modern programming practices. The language was designed as the result of a competition sponsored by the United States Department of Defense. The purpose of the competition was to define a language suitable for programming embedded computer systems. Among the requirements for the language were features that would reduce software costs by increasing maintainability, evolvability, reliability, and portability.

Ada meets these requirements by providing a modular structure for programs and allowing separate compilation of program units as well as providing strong typing, exception handling, and other standard language features that are supported across implementations. Ada provides a number of other features that make it suitable for a variety of applications, including general systems and computational applications. Because it includes language features that support multi-tasking, Ada is particularly well suited for real-time applications.

DEC ASD/SEE Toolkit for VMS

SPD: 37.09
UPI: YXZ

DEC ASD/SEE Toolkit for VMS, the AeroSpace Defense Software Engineering (ASD/SEE) Toolkit for VMS, is a collection of software applications that supplement existing Digital Equipment Corporation and third-party software products to form a complete Software Engineering Environment, which is referred to as the COHESION ASD/SEE.

The COHESION ASD/SEE product supports software development roles across the entire software development lifecycle. It is designed primarily to support programming-in-the-large, defined to be 500,000 lines of code or greater. From an organizational perspective, programming-in-the-large equates to a department/program development effort involving many small teams. The COHESION ASD/SEE solution will also prove useful for programming-in-the-medium, consisting of 50,000 to 500,000 lines of code.

The ASD/SEE Toolkit is one element of the COHESION ASD/SEE product. It provides tools and functions that help to integrate and enhance the capabilities that exist in Digital and third-party products today.

DEC AVS for ULTRIX

SPD: 33.29
UPI: YUT

DEC AVS for ULTRIX, (Application Visualization System), provides a next generation system environment which makes the power of real time visualization accessible to the technical professional. AVS models the interactive exploratory approach of the scientist, encompassing the full research and analysis steps of the visualization cycle. By including the simulation and data transformation stages in the visualization process, AVS provides the first true visualization environment.

DEC C++ for ULTRIX

SPD: 37.61
UPI: MG5

DEC C++ for ULTRIX is a native compiler which implements the C++ programming language. It includes: a C++ compiler that implements C++ as defined by *The Annotated C++ Reference Manual,* Ellis & Stroustrup, Reprinted with corrections, May 1991; DEC C, an ANSI C compiler, as described in SPD 26.40.xx; DECladebug, a symbolic debugger for C++ and C programs; DEC C++ Class Libraries; and enhanced ANSI C and XPG3 header files for use with the DEC C++ compiler.

The documentation provides comprehensive reference and usage information for all product components. Included is a copy of an authoritative book on C++, *The C++ Programming Language,* 2nd Edition, by Bjarne Stroustrup.

DEC/EDI

SPD: 31.70
UPI: YM1 (Media and documentation)
YM2 (Application component)
YM3 (Translation component)
YM4 (X.400 communications component)
YM5 (OFTP communications component)
YM6 (Bi-synch communications component)
YM7 (Bi-synch package)
YM8 (OFTP package)
YMP (X.400 package)

DEC/EDI offers application developers all the facilities necessary for Electronic Data Interchange (EDI). It enables users to electronically exchange structured business documents such as Purchase Orders, Dispatch Advice and Invoices with their Trading Partners using International, National and Industry specific EDI standards. Extensive communication options are also provided, to facilitate inter-enterprise communication via the use of either EDI VANs or OSI protocols.

DEC/EDI is a VMS layered product. DEC/EDI consists of the following components which provide a complete EDI solution: DEC/EDI Application Component, DEC/EDI Translation Component, DEC/EDI Communications Component,and DEC/EDI Management Component.

DEC/EDI can be configured such that each of these components can be located together on the same processor or distributed around the enterprise on different processors, using Digital's networking products, to provide an enterprise-wide EDI system. Multiple copies of these components can also be deployed across the enterprise to implement an EDI system ideally suited for the business needs of the Enterprise.

DEC Image Utility Library for ULTRIX

SPD: 34.48
UPI: GM1 (VAX)
GN1 (RISC)

DEC Image Utility Library for ULTRIX (IUL) provides a basic set of application-callable subroutines for use in the transport and display of CCITT compressed bitonal images between an X client and X server. The IUL subroutines are an application-programmer interface to an image-capable X server. The X Image Extension (XIE) has been proposed to the MIT X consortium as an image extension to the X protocol.

DEC IUL is intended to be used as embedded subroutines within applications constructed to include control of the display of images on video devices that are compliant with the proposed XIE standard.

The DEC IUL capabilities supply an application interface with an underlying implementation that extends the XLIB facilities of the host system with an extension of library facilities called XIELIB. In addition, IUL provides routines that aid in the integration of image applications with the host system environments.

DEC InstantSQL for Rdb/VMS

SPD: 37.60
UPI: MEQ

DEC InstantSQL for Rdb/VMS is a DECwindows Motif Graphical User Interface (GUI) for VAX Rdb/VMS that enables users to quickly compose and test complicated database queries without hand-coding complex SQL statements. Using DEC InstantSQL, users can graphically create queries, develop prototypes, or manipulate data and metadata without knowing SQL.

When DEC InstantSQL is started, the main window appears on the screen. This window contains a pictorial view of the tables and columns in the user's Rdb/VMS database. The top of the window contains a menu bar with pull-down menus listing the top-level items, such as File, Edit, Queries, Metadata, Window and Help. By pointing-and-clicking, users can manipulate the data and metadata from the DECwindows interface.

The results of the query may be viewed in a spreadsheet-style output window supporting horizontal and vertical scrolling, or saved in an ASCII text file. The SQL statement representing the query is automatically generated, and can be displayed and pasted into an application program.

DEC Pascal for DEC OSF/1

SPD: 36.72
UPI: XYV

DEC Pascal for DEC OSF/1 is an implementation of the Pascal language that complies with the ANSI/IEEE770X3.97-1983 standard and the International Standard ISO 7185-1983 (E) Level 0 and Level 1. DEC Pascal for DEC OSF/1 is a fully compliant, Class A, FIPS 109 Certified Pascal compiler. ISO Level 0 is the ANSI implementation and ISO Level 1 includes support for conformant arrays.

DEC Pascal for DEC OSF/1, Version 1.2 contains some Domain Pascal extensions, additional BSD Pascal compatibility, shared library support, enhanced documentation, and bug fixes.

The Pascal language contains control statements, data types, and predeclared procedures and functions. Containing extensions to the standard, DEC Pascal for DEC OSF/1 generates optimized code that takes advantage of the RISC hardware.

In order to enhance portability, DEC Pascal for DEC OSF/1 meets the X/Open Pascal language requirements and will apply for XPG/3 Branding. Conformance to ANSI and X/Open guidelines reinforces Digital Equipment Corporation's overall commitment to meet industry standards.

DEC Realtime Test Integrator for ULTRIX

SPD: 32.43
UPI: YUQ (Development)
YV8 (Runtime)

DEC Realtime Test Integrator for ULTRIX (RT Integrator) is an icon-based, graphical programming environment. Instead of using a conventional programming language, the user can create and run real-time (data acquisition, IEEE 488 and RS-232 instrument control, test and measurement) applications by drawing them graphically as flow diagrams.

Each DEC RT Integrator icon represents a function such as an analog or digital input, an arithmetic operation, or a logical function. DEC RT Integrator provides several libraries of such functions. The application is built by using the point-and-click method now standard in graphical user interfaces. By pointing and clicking the mouse, icons are moved from the libraries to the worksurface and then connected to the icons with either data flow or signal flow lines. Once the icons have been set up, the application is ready to run.

The worksurface acts as a graphical editor, enabling users to move, copy, delete, add, cut and paste icons representing devices and sections of code thereby allowing the user to create and change applications much more quickly than traditional programming languages.

(Continued)

DEC Realtime Test Integrator for ULTRIX *(Continued)*

Each icon has a set-up menu that allows customization of its function for the application. Once built, the application can be saved and restored without the need to repeat the set-up operations. Since the configuration is saved as an ASCII text file, it can be mailed to any other system running DEC RT Integrator and restore it there. This feature allows the user to build an application on an ULTRIX system and transport it to a VMS system or vice versa, and run it without modifications.

DEC Realtime Test Integrator for VMS

SPD: 28.30
UPI: YWQ (Development)
B15 (Runtime)

DEC Realtime Test Integrator for VMS, (RT Integrator), is an icon-based, graphical programming environment. Instead of using a conventional programming language, users create and run real-time (data acquisition, IEEE-488 and RS 232 instrument control, test and measurement) applications by drawing them graphically as flow diagrams.

Each DEC RT Integrator icon represents a function such as an analog or digital input, an arithmetic operation, or a logical function. DEC RT Integrator provides several libraries of such functions. The application is built by using the point-and-click method now standard in graphical user interfaces. By pointing and clicking the mouse, icons are moved from the libraries to the worksurface and then connected to the icons with either data flow or signal flow lines. Once the icons are set up, the application is ready to run.

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DEC Text Processing Utility (DECTPU)

SPD: 38.42
UPI: MC6

DEC Text Processing Utility (DECTPU) for RISC-based ULTRIX systems is a multi-environment, multi-platform high-performance tool designed to aid application and system programmers in developing customized text processing tools. DECTPU includes a high-level procedural language (which supports looping and conditional statements), a compiler, an interpreter, and over 130 built-in procedures. DECTPU, Version 3.0 also provides screen managers for DECwindows, Version 2.0 (XUI) and DECwindows, Version 3.0 (Motif) environments, as well as screen managers for character-cell (non-graphical) environments.

In addition, DECTPU provides the Extensible Versatile Editor (EVE), which is a text editor built upon the DECTPU language and designed for any text processing user.

DEC Trellis Object System for ULTRIX

SPD: 32.39
UPI: YLU (VAX)
YLW (RISC)

DEC Trellis Object System for ULTRIX is a comprehensive object oriented application development system. It includes a strongly-typed object oriented language, an interactive tool kit, persistent workspaces, and type library. The tool kit provides users with the ability to browse, edit, debug and compile their programs. All the tools and the incremental compiler support the object-oriented style of programming.

DEC Trellis Object System for VMS

SPD: 32.40
UPI: YLV

DEC Trellis Object System for VMS is a comprehensive object oriented application development system. It includes a strongly-typed object oriented language, an interactive tool kit, SQL database support, persistent workspaces, and type library. The tool kit provides users with the ability to browse, edit, debug and compile their programs. All the tools and the incremental compiler support the object-oriented style of programming.

DECelx Realtime Tools for ULTRIX

SPD: 37.63
UPI: MFN (ULTRIX)
MFP (MIPS)
MFQ (68K)
MFR (MIPS runtime)
MFS (68K runtime)

DECelx Realtime Tools for ULTRIX provides Realtime software for development on DECstations and DECsystem/ULTRIX platforms and a runtime environment for Motorola 68K and MIPS/R3000 based Single Board VMEbus Computers.

The products for these are known as the DECelx Realtime Tools for ULTRIX and DECelx Runtime For MIPS or 68K. There is also a DECelx BSP (board support package) for each runtime platform supported for use with the DECelx Tools.

DECelx Realtime Tools for ULTRIX is an ULTRIX layered product, which is installed on a host ULTRIX development system. The DECelx BSP is installed along with the Tools on the host system.

DECelx is a software product designed to support low-end commodity boards. It provides an easy-to-use, high performance runtime system for Realtime or distributed applications.

The DECelx Runtime environment consists of modules and utilities that, along with the user application programs, execute on a target runtime commodity board. The finished DECelx application for the Runtime Environment includes only the runtime functions that are required for the application.

DECframe for RISC ULTRIX

SPD: 31.83
UPI: YGJ
YHL (Client)
YHJ (Server)
YGK (Integration Kit)

DECframe for RISC ULTRIX is an engineering design management framework that can be used as the basis for configuring a design environment for a multiuser design team. DECframe provides design file management, tool and process management, and helps automate the design process for groups involved in ECAD and MCAD design.

(Continued)

DECframe for RISC ULTRIX *(Continued)*

DECframe increases the design engineering team's productivity by providing an open framework consisting of data management and process management features in which engineering applications (tools) can be incorporated. These tools can then be invoked from the DECframe user interface, and DECframe will manage the design files used and created by the tools. It also includes: a consistent user interface; a simple level of workflow management which helps designers walk through the complex engineering design processes; a release management feature; and configuration management that supports construction of a design object hierarchy.

DECframe is provided in several configurations. A server and a client are required to use DECframe.

The DECframe Workstation Kit, which provides a single-user version of the software, is the minimum configuration required to run DECframe.

DECmpp FORTRAN

SPD: 36.68
UPI: XT6

DECmpp FORTRAN allows data-parallel programming on DECmpp 12000 Series systems. DECmpp FORTRAN for DECmpp 12000 Series systems is an implementation of FORTRAN-77 conforming to American National Standard FORTRAN, ANSI X3.9-1978, although it is not currently validated.

DECmpp FORTRAN includes extensions from DEC FORTRAN and the Fortran 90 Standard, ANSI X3.198-1991. Fortran 90 features make it easy for programs to access the data-parallel hardware of the DECmpp 12000 Series systems.

DECmpp System Software

SPD: 36.70
UPI: XT4

DECmpp System Software is a layered software product on the ULTRIX operating system. DECmpp System Software is a set of advanced integrated tools that allows users to access the DECmpp 12000 Series Data Parallel Unit using system level commands. The software consists of two components: Extensions to ULTRIX to support the DECmpp Hardware environment; and DECmpp Programming Language (DPL), a high level C-like programming language for developing parallel application software.

The DECmpp System Software supports multi-user access to the Data Parallel Unit and interface routines for displaying data from the DECmpp software programming environment. The DECmpp System Software consists of a Concurrent Process Manager that provides simultaneous access for multiple user jobs. The Concurrent Process Manager operates by sharing memory among the various jobs rather than sharing processors. As a result, all jobs have access to the DECmpp 12000 Series system. In addition, the Concurrent Process Manager ensures that jobs have access to I/O devices, like the DEC Massively Parallel Disk Array, at all times. It also handles any contention among different jobs for the same I/O device.

The DECmpp System Software includes an I/O library that provides support for devices attached to the Data Parallel Unit, including those attached to the VMEbus interface and DEC Massively Parallel Disk Array. Using routines modeled after ULTRIX I/O functions, users can write DECmpp application programs to access the Parallel Disk Array directly. VMEbus access is accomplished via a set of routines that allow parallel data copies between the PE array and VME devices.

DECview3D

SPD: 26.95
UPI: 796

DECview3D is a software tool used for display, review, markup, analysis and manipulation of engineering graphics created by CAD (Computer Aided Design) packages. It combines data translation, snapshot generation and LiveLinks to DECwrite Compound Document Editor. DECview3D can be used to integrate engineering graphics into other applications, or as a standalone tool for display and review of those graphics.

DECview3D runs under VMS DECwindows and adheres to the XUI Style Guide. It has the same look and feel as other Digital developed DECwindows applications. DECview3D also supports graphics terminals such as VT240, VT241, VT330, VT340.

DECview3D Concurrent View and Edit Module for VMS

SPD: 31.35
UPI: XWS

DECview3D Concurrent View and Edit Module for VMS allows two users of the DECview3D software, linked by DECnet communications, to work simultaneously on the same DECview3D layout file. Users of the Concurrent View and Edit software have access to all DECview3D functions and pass control of the application back and forth. The results of all appli-cation operations are displayed on both users' DECwindows workstations.

DECview3D is a software tool used for display, review, markup, analysis, and manipulation of engineering graphics created by CAD (Computer Aided Design) packages. It combines data translation, snapshot generation and LiveLinks to the DECwrite Compound Document Editor. DECview3D can be used to integrate engineering graphics into other applications, or as a standalone tool for display and review of those graphics. Refer to DECview3D for VMS Software Product Description (SPD 26.95.xx) for a complete product description.

The DECview3D Concurrent View and Edit Module for VMS facilitates the review of engineering designs among distributed work groups and team members.

DECview3D Concurrent View and Edit Module for VMS runs under VMS DECwindows and adheres to the XUI Style Guide. It has the same look and feel as other Digital developed DECwindows applications.

DECwindows 4125 Emulator for ULTRIX

SPD: 31.59
UPI: YE9 (VAX)
YHD (RISC)

DECwindows 4125 Emulator for ULTRIX allows applications that utilize Tektronix 4125 terminal to run in a DECwindows environment. The Emulator supports functions documented by Tektronix for the Tektronix Model 4125 Color Graphics terminal. It also supports selected 4010/4014 applications.

Third-party software applications may utilize Tektronix features unique to a specific model. Customers should contact the third-party vendor regarding software compatibility with Tektronix 4125.

The DECwindows 4125 Emulator uses the same mouse and windowing techniques as other DECwindows applications. Users can use the mouse to choose commands from a menu, expand and shrink windows and rearrange windows on the screen. DECwindows-style HELP is also provided.

DECwindows 4125 Emulator for VMS

SPD: 31.60
UPI: VZQ

DECwindows 4125 Emulator for VMS allows applications that utilize Tektronix 4125 terminals to run in a DECwindows environment. The Emulator supports functions documented by Tektronix for the Tektronix Model 4125 Color Graphics terminal. It also supports selected 4010/4014 applications.

Third-party software applications may utilize Tektronix features unique to a specific model. Customers should contact the third-party vendor regarding software compatibility with Tektronix 4125.

The DECwindows 4125 Emulator uses the same mouse and windowing techniques as other DECwindows applications. Users can use the mouse to choose commands from a menu, expand and shrink windows and rearrange windows on the screen. DECwindows-style HELP is also provided.

DECwindows Developer Kit on VMS for OSF/Motif

SPD: 32.37
UPI: YMA

DECwindows Developer Kit for VMS on OSF/Motif is a development environment, based on the OSF/Motif V1.1 standard. This version of the Digital Equipment Corporation product is intended to meet the needs of software developers who are developing new Motif applications or are converting existing XUI or X Windows System-based applications to the Motif standard. This version of the software supports program development in the C language only. This development environment is comprised of components directly from OSF and some additions from Digital.

Digital Extended Math Library

SPD: 31.67 (VMS)
UPI: YEZ (VMS)
SPD: 34.44 (ULTRIX)
UPI: GKK (ULTRIX)

Digital Extended Math Library (DXML) is a set of mathematical subroutines drawn from public domain and proprietary libraries that are optimized for the VAX vector architecture. It includes the Basic Linear Algebra Subprograms (BLAS) Level 2 and BLAS Level 3 available from the Argonne National Labs. Also included are Digital proprietary subprograms for BLAS Level 1 Extensions and signal processing including one and two dimensional Fast Fourier Transforms (FFTs), Convolution, Correlation, and Digital Filters. These subprograms are highly optimized for the VAX Vector Architecture, but also support VAX scalar processing. Since DXML routines can be called from all languages that are supported by the VAX calling standards, the library permits access to VAX vector processing for applications written in other languages as well as FORTRAN or VAX MACRO.

DXML contains both a scalar library and a vector library. The scalar library is provided for development and testing of application programs. The vector library can be used for vectorization and optimization of scientific and engineering programs, as well as for mathematical software libraries.

Where appropriate, all routines are available in both real and complex versions, as well as in both single and double precision (D and G format).

The vector library uses advanced algorithms tailored to specific operational characteristics of the VAX Vector Architecture. Some key computational modules are written in assembler language, making use of the vector instruction set. Optimization techniques include chaining and overlapping of the vector functional units, as well as efficient management of the hierarchical memory system.

LinkWorks Developer's Tools for VMS

SPD: 36.26
UPI: XAR

LinkWorks Developer's Tools for VMS is a set of development tools for creating, modifying, and maintaining hyperapplications. A hyperapplication is an application that participates in a DECwindows LinkWorks environment. Hyperapplications provide linking and navigation capabilities to application end users through a new Link menu. LinkWorks support can be added to existing applications, and new applications can be designed with LinkWorks support included from the beginning.

Lucid Common Lisp/DECsystem

SPD: 32.23
UPI: YL9

Lucid Common Lisp/DECsystem is a complete implementation of Common Lisp as defined in the first edition of *Common Lisp: The Language* by Guy L. Steele Jr. All data types and operations are supported. Lucid Common Lisp also provides a number of important extensions to the language, such as a multitasking facility and an ephemeral garbage collector. Also provided, as separate modules, are enhancements to the programming environment, including an EMACS-style editor and the Window Tool Kit.

Lucid Common Lisp/VAX for VMS

SPD: 36.76
UPI: XVJ

Lucid Common Lisp/VAX for VMS is a complete implementation of Common Lisp as defined in the first edition of *Common Lisp: The Language* by Guy L. Steele Jr. All data types and operations are supported. Lucid Common Lisp also provides a number of important extensions to the language, such as a multitasking facility and an ephemeral garbage collector. Also provided, as separate modules, are enhancements to the programming environment, including an EMACS-style editor and the Window Tool Kit.

The Compiler produces high-performance and efficient code. It offers incremental compilation and both automatic and user-controlled optimizations. Lucid Common Lisp has a compiler mode designed for fast compilation during the early stages of development and a production mode that provides the optimizations that produce the fastest possible application quality code.

The Interpreter is the basis of the interactive environment with the same semantics for Lisp code as the Compiler. Compiled and interpreted code integrate completely and transparently.

OSI Application Developer's Toolkit

SPD: 34.98
UPI: GZR

OSI Application Developer's Toolkit enables users to write distributed applications that communicate over open networks and use the OSI services provided by DECnet-VAX and DECnet/OSI for ULTRIX.

(Continued)

OSI Application Developer's Toolkit *(Continued)*

The Toolkit permits the application writers to use the services of the OSI upper layers in their applications.

The Application Programming Interfaces (APIs) provide access to the OSI services supported by the underlying DECnet system.

The ASN.1 tools provide a compiler and a library of encode/decode routines.

The Toolkit supports application development on both VMS and ULTRIX for applications to be run on DECnet-VAX orDECnet/OSI for ULTRIX.

Pascal for RISC

SPD: 33.04
UPI: VV4 (Traditional)
XLU (ULTRIX ConDist)

Pascal for RISC is an implementation of the Pascal language that complies with the ANSI/IEEE 770X3.97-1983 standard and the International Standard ISO 7185-1983 (E) Level 0 and Level 1. Pascal for RISC is a fully compliant, Class A, FIPS 109 Certified Pascal compiler.

Pascal for RISC is a maintenance update which contains bug fixes and implements the License Management Facility.

The Pascal language contains control statements, data types and predeclared procedures and functions. Containing extensions to the standard, Pascal for RISC generates optimized code that takes advantage of the RISC hardware.

Pascal was designed as a language suitable for teaching programming concepts and one that would be efficient and reliable on available computers. Pascal for RISC has a large concentration in Educational institutions and is also used in the software development environment by application developers.

PDP-11 C for VMS

SPD: 33.54
UPI: 03K

PDP-11 C for VMS is a reliable language processor for Digital Equipment Corporation's proprietary operating systems on the PDP-11. It is highly compatible with the ANSI standard for the C language. PDP-11 C can be used to develop code for inclusion into resident libraries, and other low level system routines.

PDP-11 C for VMS consists of a compiler, a Run-Time Library (RTL) and documentation.

The compiler produces machine code optimized for execution speed and memory efficiency. It is highly compatible with the ANSI C standard, X3J11/90-013 February 14, 1990, and extends beyond ANSI requirements with several extensions for the PDP-11 family of central processors.

The compiler runs in native mode, as a cross compiler, on the host VMS environment and produces PDP-11 object code compatible with all the supported target systems. These target systems are RSX-11M, RSX-11S, RSX 11M-PLUS, Micro/RSX, RSTS/E, RT-11 (SJ, FB, XM), VAX-11 RSX, and VAX CoProcessor/RSX. The Run-Time Library is provided in object form.

PDP-11 Symbolic Debugger/VAX to RSX

SPD: 26.75
UPI: 139

PDP-11 Symbolic Debugger/VAX to RSX is a fully symbolic debugger for FORTRAN 77 and MACRO-11 programs running on VMS under VAX-11 RSX. PDP-11 Symbolic Debugger is a tool to aid in locating programming errors in successfully compiled programs that do not execute properly.

PDP-11 Symbolic Debugger runs as a two-task debugger. A small portion of the code, necessary to debug applications, is linked with the user task and the major portion of the debugger runs as a separate task.

PDP-11 Symbolic Debugger provides access to program symbols by reading the symbol table file produced by the task builder. PDP-11 Symbolic Debugger can understand symbols produced by FORTRAN-77 and MACRO-11.

PL/I for RISC ULTRIX

SPD: 36.81
UPI: XWZ

PL/I for RISC ULTRIX is an extended implementation of the ANSI X3.74-1981 American National Standard PL/I General Purpose Subset (Subset G). PL/I for RISC ULTRIX extensions include compatibility features with industry standard implementations, VAX PL/I, and ANSI full language features (ANSI X3.53-1976). PL/I for RISC ULTRIX consists of a compiler, a runtime library, and online reference (manual) pages. PL/I for RISC ULTRIX runs under the ULTRIX operating system on the DECstation family of processors. PL/I for RISC ULTRIX is a comprehensive and powerful programming language that supports scientific computation, commercial data handling and data organization, and extensive string manipulation. The block-structuring provided by the PL/I language helps to reduce the costs of program development and maintenance.

The PL/I for RISC ULTRIX compiler includes a compile-time embedded preprocessor facility that allows for language extension and customization, include files, and conditional compilation. As a native RISC ULTRIX language, PL/I for RISC ULTRIX is integrated into the RISC ULTRIX language environment. This integration provides PL/I for RISC ULTRIX users with support for mixed-language programs and access to the source level debugger (dbx).

PowerFrame for ULTRIX

SPD: 31.83
UPI: YGJ

PowerFrame for ULTRIX is an engineering design management framework which can be used as the basis for configuring a design environment for a multiuser design team. PowerFrame for ULTRIX provides design file management, tool and process management, and helps automate the design process for groups involved in ECAD and MCAD design.

PowerFrame for ULTRIX increases the design engineering team's productivity by providing an open framework consisting of data management and process management features in which engineering applications (tools) can be incorporated. These tools can then be invoked from the PowerFrame user interface, and PowerFrame will manage the design files used and created by the tools. It also includes: a consistent user interface; a simple level of workflow management which helps designers walk through the complex engineering design processes: a release management feature; and configuration management that supports construction of a design object hierarchy.

PowerFrame for ULTRIX is provided in several configurations. A server and a client are required to use PowerFrame.

The PowerFrame Workstation Kit, which provides a single user version of the software, is the minimum configuration required to run PowerFrame.

PowerFrame for VMS

SPD: 34.73
UPI: GTV (VMS workstations and clients)
GTX (VMS servers)
GTY (Integration kit)

PowerFrame for VMS is an engineering design management framework which can be used as the basis for configuring a design environment for a multi-user design team. PowerFrame provides design file management, tool and process management, and helps automate the design process for groups involved in ECAD and MCAD design.

TPframe

SPD: 37.22
UPI: MB3

TPframe is a tool for developing database-oriented, transaction processing applications in an ULTRIX/SQL environment. TPframe has been tested to ensure operational stability and usability.

TPframe consists of two components; UNIX System Laboratories' TUXEDO/T transaction monitor, and a software interface that supports transactional semantics between the transaction monitor and the ULTRIX/SQL database management system (DBMS). The software interface follows the X/Open XA interface specification of April 1990.

Together, these two components provide an ideal application development platform, one which allows the developer to focus on application development rather than interoperability between the transaction monitor and the operating system.

TPframe provides facilities for creating client/server applications and their associated terminal menus. Once applications are created, TPframe can be used to test the applications and migrate them to a production environment.

TPframe is specifically designed to operate in conjunction with Digital's ULTRIX/SQL DBMS, as well as with the ULTRIX/SQL C preprocessor. The C preprocessor translates embedded SQL statements into native C language statements, which provide the protocol necessary to access the ULTRIX/SQL DBMS.

ULTRIX Worksystem Software

SPD: 28.22
UPI: 0JQ (VAX)
VV1 (RISC)

ULTRIX Worksystem Software (UWS), is an "integrated" system based upon two major components: the ULTRIX operating system, Digital Equipment Corporation's native implementation of the UNIX operating system for all currently supported VAX and Digital RISC systems, and an extensive windowing environment based on the X Window System standard that supports general users and graphics applications developers while taking full advantage of the specialized graphics hardware of the workstations.

UWS provides users of ULTRIX workstations with a common user interface and a base set of bundled applications.

UWS provides the application developer with a set of Style Guides and the tools which help to implement that style.

UWS also contains Display PostScript, from Adobe Systems Incorporated.

VAX Ada

SPD: 26.60
UPI: 056

VAX Ada is Digital Equipment Corporation's validated implementation of the full ANSI/MIL-STD-1815A-1983 Ada Language. The VAX Ada compiler runs under the VMS operating system and generates optimized, shareable, and position-independent code.

As a native mode VMS language, VAX Ada is integrated into the VMS common language environment. All VMS system services and utilities are thus available to programs written in VAX Ada. VAX Ada supports the VAX Record Management Services (RMS) sequential, relative, and indexed file organizations and associated access methods. VAX Ada programs can invoke modules written in other VMS languages. Additionally, programs written in other languages can invoke VAX Ada modules.

Ada is a powerful, general-purpose language that supports many modern programming practices. The language was designed as the result of a competition sponsored by the United States Department of Defense. The purpose of the competition was to define a language suitable for programming embedded computer systems. Among the requirements for the language were features that would reduce software costs by increasing maintainability, evolvability, reliability, and portability.

Ada meets these requirements by providing a modular structure for programs and allowing separate compilation of program units, as well as providing strong typing, exception handling, standard language features that must be supported across implementations. Ada provides a number of other features that make it suitable for a variety of applications including general systems and computational applications. Because it includes language features that support multitasking, Ada is particularly well suited for realtime applications.

VAX APL

SPD: 25.31
UPI: 020
XAA (High performance option)

VAX APL (A Programming Language), is a concise programming language that can be used for a wide range of applications. It simplifies the handling of numeric and character data organized as lists and tables.

VAX APL is a native-mode, shareable, reentrant interpreter that runs under the VMS operating system. It provides a built-in function editor, debugging aids, system communication facilities and a file system. VAX APL can execute lines of code immediately or store the code for later execution.

VAX APL uses virtual memory to create a "workspace" that can expand dynamically as needed and utilizes the VAX Floating-Point and Character String instructions.

VAX BASIC

SPD: 25.36
UPI: 095

VAX BASIC is an interactive, shareable language processor that utilizes the VAX floating-point, decimal, and character instructions. It provides a program development environment for both applications development and timesharing by generating in-line VMS native mode instructions.

VAX BASIC provides a high-performance program development environment for both applications development and timesharing by generating in-line VMS native mode instructions. It combines the power of a structured programming language with the interactivity of the BASIC environment and the convenience of

(Continued)

VAX BASIC *(Continued)*

easy-to-use graphics statements. VAX BASIC is also integrated with various programming productivity tools and key components of the VAX Information Architecture.

VAX BLISS-32 Implementation Language

SPD: 25.12
UPI: 106

VAX BLISS-32 Implementation Language is a high-level systems implementation language for VAX systems. BLISS-32 supports modular software development according to structured programming concepts. It provides an advanced set of language features and access to most VAX hardware features to facilitate programming of realtime and hardware-dependent applications.

BLISS-32 is used for developing operating systems, compilers, runtime system components, database file systems, communications software, utilities, and more.

The compiler runs in native mode under VMS. It translates BLISS-32 source programs into relocatable object modules that can be linked for execution.

This language includes separately compiled modules; expressions for describing actions to be performed; declarations for allocating, describing, and initializing data; declarations for defining macros and literals; longwords of 32 bits for data manipulation; operators; field references; character sequence functions; IF, CASE, SELECT, and SELECTONE; DO, WHILE, and UNTIL; INCR and DECR; LEAVE; OWN and GLOBAL; LOCAL, STACKLOCAL, and REGISTER; INITIAL and PRESET; STRUCTURE; ROUTINE; REQUIRE; LIBRARY; MACRO and KEYWORDMACRO; %IF, %THEN, %ELSE, and %FI; and lexical functions.

Specialized BLISS-32 features include LINKAGE, PSECT, BUILTIN, and ENABLE.

BLISS-32 integrates into the VAX Common Language Environment. This integration provides VAX BLISS-32 users with support for VAX interlanguage calling standards, LSE, and VAX Source Code Analyzer; access to VMS system services and the VAX Symbolic Debugger; and callable interfaces to the VAX Common Run-Time Library and VAX utilities.

BLISS-32's compiler performs global and local optimization to produce efficient and compact generated code. It treats each routine definition as a complete unit in compiling the code for that routine. The compiler optionally checks for certain language usage that, while technically correct, is likely to be a coding error. BLISS-32's compiler optionally produces a listing file that shows the source text compiled and the generated code. The format closely resembles a VAX MACRO assembly listing. Multiple listing options allow selective inclusion or exclusion of source-generated code, use of source names in the listing in place of machine register names, macro expansion and tracing information, and use of names from library files. The listing includes a detailed symbol cross-reference.

VAX C

SPD: 25.38
UPI: 015

VAX C is an extended implementation of the C programming language originally developed at Bell Laboratories. The VAX C compiler runs under the VMS operating system and generates optimized and position-independent code.

As a native-mode VAX language, VAX C is integrated into the VAX common language environment. All VAX system services are thus available to programs written in VAX C. VAX C supports VAX Record Management Services (RMS), including sequential, relative, and indexed file organizations and associated access methods, in addition to the stream file-access conventional among most C implementations. VAX C programs can invoke, as functions, modules written in other VAX languages.

VAX C provides assistance in decomposing loops. Decomposed loops run in parallel in multiple processes, reducing the total elapsed time required to run the program. This capability is most useful on multiple processor machines, such as the VAX 8800.

VAX C supports the lint-like features of the Source Code Analyzer component of VAX Language-Sensitive Editor/Source Code Analyzer. The combination of using function prototypes and the Source Code Analyzer component allows the programmer to check for consistent function usage throughout a program environment. VAX C also generates complete debug and traceback records for use with the VAX Symbolic Debugger. The Debugger allows the C programmer to set breakpoints, examine and modify the contents of user variables, and selectively halt or continue program execution.

VAX COBOL

SPD: 25.04
UPI: 099

VAX COBOL is a high level language for business data processing that operates under the VMS operating system, taking full advantage of the system facilities and the VAX Information Architecture. It is based upon the 1985 ANSI COBOL Standard X3.23-1985.

VAX COBOL shares some common syntax with COBOL-81/RSTS/E and COBOL-81/RSX and includes a COBOL-81 subset flagger. It is integrated with the VAX Information Architecture and includes various Digital extensions to COBOL, including screen handling at the source language level.

VAX COBOL has been validated by the National Bureau of Standards for conformance to FIPS PUB 21-2, Federal Standard COBOL at the high level.

Two features provide access to the VAX Information Architecture from VAX COBOL. The Data Manipulation Language (DML) allows users to access DBMS databases with VAX DBMS. VAX DBMS must be installed to use this feature. The COPY FROM DICTIONARY statement, a Digital extension to COBOL, allows access to common record definitions stored in VAX CDD/Plus. VAX CDD/Plus must be installed to use this feature.

VAX COBOL, COBOL-81/RSTS/E and COBOL-81/RSX share many common features. These features are implemented with the same syntax and semantics on both compilers. In this way, a VMS system may be used to develop code that will eventually be compiled using COBOL-81. A COBOL-81 subset flagger may be used to check code designed for eventual use on COBOL-81. Additionally, code developed using COBOL-81 may be migrated to VAX COBOL.

VAX COBOL GENERATOR

SPD: 27.16
UPI: 365

VAX COBOL GENERATOR is a screen-oriented program generator that produces VAX COBOL source programs. Commercial programmers use the VAX COBOL GENERATOR as a productivity tool for the creation and maintenance of data processing applications. The programmer can create or modify a program by choosing icons that represent the components making up the

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VAX COBOL GENERATOR *(Continued)*

program (menus, screens, etc.). From this input, the VAX COBOL GENERATOR produces a VAX COBOL source program that can be used like any other source program. Also, the VAX COBOL GENERATOR can be used for rapid prototyping to produce a program that can later be expanded and refined to become a production application. Thus, programmers can produce and maintain VAX COBOL programs in much less time than by traditional hand coding.

VAX COBOL GENERATOR runs under the VMS operating system. The VAX COBOL GENERATOR can produce programs that call subprograms written in other VMS languages, as well as many Runtime Library routines and system services. Similarly, programs produced by the VAX COBOL GENERATOR can be called by other VMS products adhering to the VAX Calling Standard. The default screen interactions utilize the VAX COBOL extensions to the ACCEPT and DISPLAY statements. However, the VAX COBOL GENERATOR can produce screen applications that use other screen packages, such as VAX FMS (Forms Management System). These VAX COBOL source programs can be debugged by the VAX Symbolic Debugger.

To define an application in the VAX COBOL GENERATOR environment, the programmer selects and places icons (representing various parts of the application) in the screen work area for expansion. Data and procedural flow are specified by connecting these parts together. The VAX COBOL source code generated is then compiled by the VAX COBOL language processor and linked by the VAX Linker. These applications can then be executed on any valid VMS operating system.

VAX DEC/CMS

SPD: 25.52
UPI: 007

VAX DEC/CMS (Code Management System) is a library system that facilitates the development and maintenance of software systems. Software systems are divided into different functional components that are, in turn, organized into sets of one or more files. During development, one or more programmers continually make changes to these files. VAX DEC/CMS helps manage the files during development (and later during maintenance) by storing the files in a project library, tracking changes, and monitoring access to the library.

VAX DEC/CMS also supplies a means of manipulating different combinations of files within a library. The ability to formalize these combinations provides a focus for system design and a means of organizing the files within a library.

VAX DEC/CMS supports the DECwindows software environment, and provides either a DECwindows or command line user interface.

VAX DEC/CMS is included in the VAXset (SPD 27.07.xx) Software Development Tools Package. This package provides simplified ordering and maintenance of various tools. See the appropriate Software Product Description for more information on VAXset.

VAX DEC/MMS (Module Management System)

SPD: 26.03
UPI: VAD

VAX DEC/MMS (Module Management System) is a software tool designed to enhance programmer productivity. It determines what components in a described software system have changed, and rebuilds the system in an optimal way.

When some modules of a software system are modified, dependent modules may need to be recompiled. VAX DEC/MMS determines which modules need to be recompiled, and performs the appropriate actions to ensure that the software system is recompiled and linked with all the latest changes. Additionally, VAX DEC/MMS has the ability to interact with VAX DEC/CMS (Code Management System, SPD 25.52) and other VMS software productivity tools.

VAX DEC/MMS is included in the VAXset (SPD 27.07) software development tool package. This package provides simplified ordering and maintenance of various tools. See the appropriate Software Product Descriptions for more information on VAXset.

VAX DEC/Shell

SPD: 26.69
UPI: 143 (1 to 16 users)
144 (32 users)

VAX DEC/Shell provides the same user interface found in the native UNIX, namely, the Bourne Shell. VAX DEC/Shell is an alternative command language interpreter to DCL.

VAX DEC/Shell, along with VAX C, VAX DEC/CMS and VAX DEC/MMS, makes up the VMS layered product set for VNX. It provides functionality similar to UNIX.

VAX DEC/Shell features environment variables, pipes, user-definable search paths for command execution, control-flow primitives, parameter passing, and UNIX file name syntax. Other features include input and output redirection to and from files, commands and utilities similar to those on a UNIX system, string substitution, structured constructs, modification of a command's environment, a shell runtime library, mechanisms for using DCL from VAX DEC/Shell, and interfaces to VAX DEC/CMS and VAX DEC/MMS.

VAX DEC/Shell includes a tailorable user environment, commonly used UNIX utilities, a text processing package, communication utilities, and terminal operation routines.

VAX DECscan VMS Software Toolkit

SPD: 26.98
UPI: VCS

VAX DECscan VMS Software Toolkit is used as an industrial application platform to provide data acquisition, alarm detection with controlling actions and reporting, action sets (sequence control), closed loop regulatory control, and an external utility interface. VAX DECscan supports the I/O products of Honeywell and Phoenix and treats the logical I/O point tags in a device-independent fashion.

DECscan's menu-driven interactive utility provides the primary user interface to define and configure the application. Supported features include online definition and configuration of device-independent I/O point tags, alarms, action sets, and closed-loop controls; I/O vendor-specific prompts; online monitoring of the DECscan Toolkit operation and status; online control of alarms, control loops, and data acquisition; online forcing of output type I/O point tags; realtime operator display of field I/O values in preconverted engineering units; time-stamped configuration lists of current database definitions; and DECnet support.

DECscan's runtime task processes the DECscan Toolkit functions. Features include an in-memory database that contains the DECscan Toolkit I/O point data (realtime I/O values) and all the user-defined information used to control the Toolkit application functions; configurable processing of the data acquisition, alarms, action sets, and control loops; and controlling actions connected to alarms and action sets.

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VAX DECscan VMS Software Toolkit *(Continued)*

DECscan's callable routines are invoked by user-written application programs to monitor and control Toolkit status and operation. The callable routines allow application programs to obtain the current values of I/O tags; force new values to output type I/O tags; control the execution of preconfigured alarms, control loops, and action sets; and interface database values to other VMS utilities.

DECscan's point logging utility provides periodic logging of I/O values on terminals and in files. It can provide historical data to other VMS utilities or track I/O point values in real time. Several such sessions can run in parallel, each with its own set of tags to log. All I/O values are time-stamped.

DECscan's graphics interface provides the interface between the realtime I/O data of the Toolkit's database and the DataViews industrial graphics package sold by V.I. Corporation. The graphics interface automatically accumulates the list of I/O tags referenced in the views generated by DV-Draw. They will periodically read the latest I/O values of those tags and update the appropriate pictures on the user's graphics screens.

VAX DECscan VMS Software Toolkit applications include factory floor monitoring and automation, remote high-speed data acquisition and control, product handling, and environmental control.

VAX FORTRAN

SPD: 25.16
UPI: 100

VAX FORTRAN is an implementation of full language FORTRAN-77, conforming to American National Standard FORTRAN, ANSI X3.9-1978. It includes optional support for programs conforming to the previous standard, ANSI X3.9-1966. VAX FORTRAN meets the Federal Information Processing Standard Publication (FIPS-69-1) requirements for a flagger. The flagger optionally produces diagnostic messages for compile-time elements that do not conform to the full-level ANSI FORTRAN X3.9-1978 Standard. VAX FORTRAN also conforms to the International Standard ISO 1539-1980(E) and to MIL-STD 1753, with the exception of the specific syntax for octal and hex constants.

The shareable, reentrant compiler operates under the VMS operating system. It globally optimizes source programs while taking advantage of the VAX floating point and character string instruction set and the VMS virtual memory system.

VAX FORTRAN for ULTRIX Systems

SPD: 27.23
UPI: A99
YV7 (High performance option)

VAX FORTRAN for ULTRIX Systems is an implementation of full language FORTRAN-77 that conforms to American National Standard FORTRAN, ANSI X3.9-1978. Optional support for the previous standard (ANSI X3.9-1966) is included.

The reentrant compiler operates under the ULTRIX-32 operating system and globally optimizes source programs while taking advantage of the VAX floating-point and character-string instruction set and the ULTRIX demand-paged, virtual memory system.

Extensions to the ANSI standard include composite data declarations using STRUCTURE, END STRUCTURE, and RECORD statements; access to record components through field references; a set of data types beyond those specified for full language FORTRAN-77; explicit specification of storage allocation units for data types; data initialization in type declaration statements; and more.

The system also provides a multiphase optimizer that can perform optimizations across entire program units.

VAX FORTRAN High-Performance Option

SPD: 32.67
UPI: YHB

VAX FORTRAN High-Performance Option (HPO) is an optional enhancement to the VAX FORTRAN compiler. HPO enables the FORTRAN compiler to automatically generate vector-processor instructions and to automatically decompose programs to improve performance on multiple-processor systems.

HPO adds a new ASSERT statement, which provides additional information to the compiler about the program. The ASSERT statement can be used in some programs to achieve a high degree of vectorization and/or automatic decomposition. The ASSERT statement can optionally generate code to verify the assertions at run time, if desired. ASSERT statements can be specified in directive form for portability and will be ignored by other compilers since they will appear as comments.

HPO also adds the INIT_DEP_FWD directive to allow vector processing for many loops that would otherwise not qualify due to unknown data dependencies. As this directive may change the meaning of the program, Digital does not warrant execution results conforming to the FORTRAN standard when this directive is used.

VAX Image/3L Supporting Software for VMS

SPD: 33.42
UPI: PV0

VAX Image/3L Supporting Software for VMS is a programmer interface allowing access to the Image/3L image accelerator option module. It is used for display of bitonal images and provides software support of the hardware that accelerates image decompression, scaling, and rotations of 90°, 180°, and 270°.

The Image/3L module can be used only in monochrome systems and is designed to plug into the color option slot of a VAXstation 3100 (Model 30, 40, 38, 48), or a VAXstation 2000.

VAX Image/3L Supporting Software includes a device driver that provides a VMS interface to the Image/3L hardware module. A shareable subroutine library is also included that provides a callable interface equivalent to that of the DECimage Application Services (DAS)/Image Display Services (IDS) with the functional differences listed below. Refer to the DECimage Application Service Software Product Description (SPD 25.E8.xx) for more information on DECimage Application Services and, in particular, Image Display Services.

The shareable library will determine if the Image/3L hardware module is present and use it to accelerate image operations whenever possible. Only one process at a time can access the Image/3L hardware module. If the Image/3L hardware is in use by another process, the shareable library will perform the required image operations in software. Applications designed to use IDS should be able to make use of the Image/3L by relinking to the Image/3L shareable library. There are several minor differences between the DECimage version of IDS and the Image/3L version.

VAX LSE (Language-Sensitive Editor/Source Code Analyzer)

SPD: 26.59
UPI: 057

VAX LSE (Language-Sensitive Editor/Source Code Analyzer) is an integrated environment that provides software professionals with editing, cross reference, and static analysis capabilitites. It is a multilanguage, multimodule, and multiwindow tool that is useful for program design, development, and maintenance.

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VAX LSE (Language-Sensitive Editor/Source Code Analyzer) *(Continued)*

The two main components of this product are the Language-Sensitive Editor and the Source Code Analyzer. The Language-Sensitive Editor component provides the following capabilities: source code templates, the ability to do low level program design by embedding pseudocode in source code, the ability to view source code at various levels of detail by replacing a sequence of source lines with a single overview line, and access to online language specific help. Together, this support enables new and experienced programmers to develop programs faster through VAX language specific construct completion and error detection and correction facilities.

The Source Code Analyzer component aids developers in understanding the complexities of software systems. Since it allows a developer to analyze an entire system as opposed to individual modules, and helps the developer understand unfamiliar systems, the Source Code Analyzer component is extremely useful during the implementation and maintenance phases of a project. The Source Code Analyzer component provides source code navigation, cross reference, and static analysis for compile-time source code information generated by supported VAX languages. Additionally, the Analyzer provides design cross reference, analysis, and reports for pseudocode and specialized comment processing information generated by supported VAX languages.

The Language-Sensitive Editor component supports the DECwindows software environment, and provides either a DECwindows or a character cell terminal interface. All the Source Code Analyzer commands are available from within an editing session.

The VAX Language-Sensitive Editor/Source Code Analyzer is included in the VAXset Software Engineering Tools Package (SPD 27.07). This package provides simplified ordering and maintenance of various tools. See SPD 27.07 for more information on VAXset.

The VAX Language-Sensitive Editor/Source Code Analyzer works in concert with supported VAX languages and the VAX Symbolic Debugger to provide a highly interactive, on-line environment that facilitates the EDIT-COMPILE DEBUG-NAVIGATE-ANALYZE portion of the program development cycle. Within a single editing session, users can write, edit, compile, review compile time errors, correct errors, navigate through, and analyze their source code.

The Language-Sensitive Editor component can be invoked directly from the VAX Symbolic Debugger to correct source code errors found during a debugging session.

Users can customize the environment by tailoring and expanding upon the features and structures provided by the Language-Sensitive Editor component. User-defined environments can be saved for future use.

VAX Media Manager

SPD: 31.40
UPI: VZD

VAX Media Manager (MMG) is a VMS operating system layered product that provides enhanced functionality to one or more RV64 optical jukeboxes. It is intended as a tool for applications developers and as a utility for system managers and operators.

MMG's database keeps track of the content and status of jukeboxes, drives, cartridges, and volumes, eliminating the requirement for users and applications developers to monitor the location and status of individual drives and cartridges. Jukeboxes and drives are made known to MMG via MMG's CONFIG command, which queries VAX Jukebox Control Software (JCS) configuration data. Cartridges and volumes are made known to MMG via the ADD CARTRIDGE command. As MMG operations are performed, entries in MMG's databases regarding the status of these objects are updated.

MMG makes use of a hook provided in the VMS $MOUNT utility; when the VMS $MOUNT utility detects a request for a media mount on an RV60 drive in an RV64 jukebox, it calls MMG to ascertain the availability of the drive and requested volume. MMG then calls VAX JCS to perform the physical jukebox commands necessary to pull the optical cartridge from its location in the jukebox and place it in the desired drive.

VAX MMG supplies a callable runtime library interface as well as a Digital Command Language (DCL) interface.

VAX MMG Run-Time Library (RTL) routines are intended to be called from user-written programs to perform jukebox functions. Any program written in one of the VMS operating system supported languages can call any procedure in the VAX MMG RTL. VAX MMG RTL calls conform to standard VMS systems interface specifications for Creating Modular Procedures, which allow mixed language programming.

VAX MMG is contained in the VAX MMG RTL as a shareable installed image. Only the DCL and callable RTL interfaces are accessible by the user.

VAX Pascal

SPD: 25.11
UPI: 126

VAX Pascal is an implementation of the Pascal language that accepts programs compatible with either level of the ISO specification for Programming languages; Pascal (ISO 7185-1983(E)) as well as ANSI/IEEE 770X3.97-1983 (December, 1983). VAX Pascal also meets the Federal Information Processing Standard Publication (FIPS-109) requirements by accepting programs conforming to the ANSI standard. VAX Pascal also accepts many features from the Extended Pascal standard (ANSI/IEEE 770X3.160-1989 and ISO 10206).

The compiler has been validated for both levels of the ISO unextended Pascal standard and for conforming to FIPS-109. Containing extensions to the standards, VAX Pascal generates optimized, shareable code that takes full advantage of the VAX hardware floating point and character instruction sets and the virtual memory capabilities of the VMS operating system. The language contains control statements, data types, and predeclared procedures and functions.

VAX PL/I

SPD: 25.30
UPI: 114

VAX PL/I, an extended implementation of the ANSI X3.74 1981 American National Standard PL/I General Purpose Subset, includes compatibility with industry standard implementations, ANSI full language features, and features specific to VMS. The software consists of a shareable compiler, a HELP facility, and a system interface library that includes declarations for system routines. The compiler generates optimized, position independent machine code.

VAX PL/I is a comprehensive programming language that supports scientific computation, commercial data handling and data organization, and extensive string manipulation.

(Continued)

VAX PL/I *(Continued)*

VAX PL/I allows access to VAX CDD. A compile-time preprocessor facility allows language extension and conditional compilation. All system services, the VAX Common Run-Time Library, and VAX system utilities are available through the PL/I CALL statement. A library of predefined ENTRY declarations minimizes the coding required.

A native-mode VMS language, VAX PL/I integrates into the VAX VMS Common Language environment. This integration provides user support for the VAX Interlanguage Calling Standard, access to the VAX Symbolic Debugger (including support for source line debugging), and callable interfaces to VAX utilities and optional products.

Features include a full complement of data types, an assignment operator, VAX RMS file organization support, five storage classes, a refer option, structured program control and structuring statements, condition handling, I/O control, preprocessor statements and expressions, picture variable validation, and efficient object code generation.

Other features include language elements that support the VAX extended range and precision floating point architectural features, a REFER option, ALLOCATE statements, LIKE and UNION attributes, built-in funtions, expressions in format lists, replication factors, compiler options, and INITIAL values.

VAX PL/I optimizations include value propagation, subexpression elimination, local variable allocation, invariant computation removal, Boolean expression simplification, special case code generation, pattern replacement, and in-line expansion of procedure calls.

VAX RALLY

SPD: 27.03
UPI: A86

VAX RALLY provides a powerful fourth generation environment for developing interactive database applications. As an integrated package, RALLY provides tools to define Rdb/VMS databases, forms, reports, menus, and online help for the application user.

Application developers can use VAX RALLY's menu interface and extensive defaulting capabilities to create simple applications quickly. More sophisticated applications can be created in the RALLY editing environment.

VAX Realtime Accelerator Software (VAX RTA)

SPD: 29.43
UPI: VJN

VAX Realtime Accelerator Software (VAX RTA) is a layered product that integrates the VAXELN message passing capability with VMS operating system software. With VAX RTA and the VAXELN Toolkit, users can develop realtime applications that can be distributed between the VMS host processor and the VAXELN-based KA800 processors.

VAX RTA enables the VMS host processor to control the VAXELN realtime processors using either program control or through a command language interface. VAXELN-based KA800 processors communicate with the VMS host and each other at DMA speeds over the VAXBI bus. Communication between processors occurs through standard VAXELN message passing services and the VAX RTA runtime library procedures.

VAX RTA can improve overall system performance by putting the computing power closer to the realtime event that is being controlled or monitored; reduce and even eliminate the impact of an intensive operation on the VMS host system by distributing realtime data handling to dedicated VAXELN VAX RTA processors; and can increase available memory for the VMS system and performance of the realtime processor by having each realtime processor with its own local memory for the application program.

Realtime applications are developed and debugged using the standard VAXELN Toolkit. VAXELN applications, including device drivers, can be developed entirely in a high-level language.

VAX SCAN

SPD: 26.93
UPI: 495

VAX SCAN is a high-level language designed for text processing. In addition to the commonplace string operators such as concatenation, substring, extraction, and comparison, VAX SCAN has constructs for matching complex text patterns and sorting. These capabilities make VAX SCAN particularly useful for building filters, translators, extractors, preprocessors, and parsers.

As a native-mode VAX language, VAX SCAN is integrated into the VMS Common Language Environment. Its programs can invoke and be invoked by routines written in other VMS languages, as well as many runtime library routines and VMS system services and utilities. VAX SCAN programs can be debugged using the VAX Symbolic Debugger. VAX SCAN can also be integrated with the VAX Language-Sensitive Editor (LSE) and with VAX Source Code Analyzer (SCA).

VAX SCAN is implemented as an optimizing compiler that produces standard VMS object modules. These modules can be linked with modules written in other VMS languages to produce an executable image that can be executed by the VMS RUN command.

VAX Xway

SPD: 27.36
UPI: 729

VAX Xway is a spreadsheet model and data conversion application designed for use with spreadsheets, database managers, and any other application that produces or accepts data in one of the supported storage formats. It converts constant data (numbers and text) between all supported formats. It also converts spreadsheet models between those selected formats which store relationships, formulas, and formats, as well as constant data.

The supported storage formats are: WKS, WK1, WRK, DIF, SYLK, VAX DECalc, and VAX DECalc-PLUS or VAX Xway-produced Command files, ASCII tabular data with a specified separator, and ASCII data which can be described as fields.

VAXELN Ada

SPD: 27.22
UPI: A97

VAXELN Ada is a VMS layered product for developing Ada language applications which run in a standalone or embedded environment on VAX processors under the VAXELN realtime executive.

Typical VAXELN Ada applications are ones in which individual processors have dedicated or otherwise predetermined functions and are not needed simultaneously for general computing, program development, or other uses for which a general-purpose operating system (e.g., VMS) is more appropriate. Other uses are in embedded systems, where the processor is an integral part of a larger device and the resources of a general-purpose computer system, such as a disk, are not available. Examples include industrial automation, workstations designed for a particular profession, Ethernet server networks and robots.

(Continued)

VAXELN Ada *(Continued)*

VAXELN Ada is especially suited to, although not limited to, creating realtime applications; that is, applications in which the system's response to external events is critical. Such applications include the typical scientific and industrial data processing situations in which the computer's operation has to be precisely synchronized with machines and special input/output devices.

VAXELN Ada applications are developed using VAX Ada and the VAXELN Toolkit on a host VMS system. The resulting bootable, VAXELN-based Ada application is then moved to the VAXELN target system using disk or tape media, an Ethernet Local Area Network (LAN) link, or programmable read-only memory (PROM). The application program executes on the target system as a dedicated system. The network link to the host development system may be used for remote debugging.

VAXELN KAV Toolkit Extensions for VMS

SPD: 34.18
UPI: GES

VAXELN KAV Toolkit Extensions for VMS is a VMS layered product. It can be used in conjunction with the VAXELN Toolkit to develop dedicated realtime systems to run on the KAV30 module.

The KAV30 is a VMEbus-based, VAX-realtime single board computer that runs a user's ELN system. It is based on the rt-VAX300 processor daughter module which contains a 2.7-VUP CMOS processor, a CMOS VAX floating-point coprocessor, a CMOS second-generation Ethernet coprocessor, VSB, optional SCSI controller, and 4 Mbytes or 16 Mbytes of memory.

With the KAV30, a user can now put a VAX on the VMEbus, integrating the application into Digital Equipment Corporation's extensive computing and networking environment. Data can be communicated to and from devices on a DECnet or TCP/IP network, providing a means of total integration from the realtime device to the data center. For the KAV30, the user develops the application on a VAX VMS Host Development System using the VAXELN Toolkit and the VAXELN KAV Toolkit Extensions. The application can then be built into an ELN Target System, which can be down-line loaded into a KAV30 over an Ethernet, booted from SCSI disk, or booted from EPROM.

VAXELN Toolkit

SPD: 28.02
UPI: 375
376 (Runtime)

VAXELN Toolkit is a VMS layered product used for the development of dedicated realtime VAXELN systems that run on VAX and MicroVAX processors. The development tools run on any host VAX computer under VMS or MicroVMS operating systems. A finished VAXELN system runs directly on a supported runtime target VAX or MicroVAX processor without the presence of another operating system.

VAXELN is especially suited to, although not limited to, creating realtime applications; that is, applications in which the system's response (both speed and predictability) to external events is critical.

The VAXELN software simplifies the design and implementation of such applications by offering high-level language support, a runtime kernel executive and various service programs. The high level language support includes a Pascal compiler and runtime libraries (RTL) for VAX C and VAX FORTRAN. Support for VAX Ada is available under separate license. The kernel manages resources, processes and shared data. The runtime service programs available are for a VMS compatible file system, network communication facilities and device drivers.

VAXELN supports multitasking; that is, execution of a program made up of several concurrently executing parts. In addition, multiprogramming is supported, meaning that entire programs, including multitasking programs, can be scheduled concurrently on the same CPU.

VAXELN provides support for tightly coupled symmetric multiprocessing on the VAX 6000 Model Series 200, 300 and 400, and VAX 8800 configurations. Each processor executes a single copy of the system image and jobs can run on either processor.

VAXELN DECwindows is based on M.I.T.'s specification for the X Window System. X Window System standards supported as part of DECwindows include the X11 network protocol, a base set of workstation fonts, the C language binding for the Xlib programming library and the C language binding for the Xtoolkit library. Support of the X11 network protocol in the client, library and display server components provides VAXELN with the capability to interoperate with other X11 compliant systems in a distributed fashion.

VAXELN supports the server-client distribution inherent in the X Window System with three VAXELN-provided transports—local shared memory and DECnet.

VAXELN DECwindows provides full client/server functionality. Provided are the DECwindows server image, the DECwindows runtime libraries and the user environment component DECwindows software, all of which can be built into VAXELN systems.

VAXELN Window Server for ULTRIX

SPD: 33.68
UPI: YWR

VAXELN Window Server for ULTRIX is an ULTRIX layered product that loads a DECwindows kernel onto a VAXstation over Ethernet to provide X-Window terminal functionality.

EWS consists of VAXELN system images, ULTRIX programs, and ULTRIX shell scripts to set up an environment in which a host ULTRIX system provides DECwindows client services for Digital Equipment Corporation workstations. The host ULTRIX system operates as a boot server, down-line loading the appropriate VAXELN Window Server system images to the workstations. The ULTRIX system and the workstation then appear to operate as a single ULTRIX DECwindows workstation.

The VAXELN Window Server software provides a DECwindows solution for diskless workstations and, depending on the configuration, may greatly improve windowing performance.

EWS provides the same look and feel of high-resolution workstations with the economies of centralized system management. Users can run applications on the processor best suited for the task and share data across the network.

Common fonts have been built into the runtime system image, thus decreasing the time necessary for font loading and improving response time for many applications.

Communication between the boot server node and the workstation is DECnet, TCP/IP, or both.

VAXELN Window Server for VMS

SPD: 33.69
UPI: 376

VAXELN Window Server for VMS (EWS) is a VMS installed product that loads a DECwindows kernel onto a target VAXstation over Ethernet to provide X Window terminal functionality.

(Continued)

VAXELN Window Server for VMS *(Continued)*

EWS consists of VAXELN system images and VMS DCL command files to set up an environment in which a host VMS system provides DECwindows client services for Digital workstations and VT1300 terminals. The VMS system operates as a boot server, down-line loading the appropriate VAXELN Window Server system images to the workstations and VT1300 terminals. The VMS system and the workstation or terminal then operate as an integrated VMS DECwindows workstation.

The VAXELN Window Server (EWS) software provides a DECwindows capability solution for diskless workstations and, depending on the configuration, can greatly improve windowing performance.

EWS provides the same look and feel of high-resolution workstations with the economies of centralized system management. Users can run applications on the processor best suited for the task and share data across the network.

Common fonts have been built into the runtime system image, thus decreasing the time necessary for font loading and improving response time for many applications.

Communication between the boot server node and the workstation or VT1300 terminal is DECnet, TCP/IP, or both.

VAXset Package

SPD: 27.07
UPI: 965

VAXset Package (Software Engineering Tools) is comprised of five component products: VAX Language-Sensitive Editor/Source Code Analyzer; VAX Performance and Coverage Analyzer; VAX DEC/CMS; VAX DEC/MMS; VAX DEC/Test Manager.

These products provide a set of software engineering tools for the development, testing, and maintenance of application programs. Four products (VAX Language-Sensitive Editor/Source Code Analyzer editor component, VAX Performance and Coverage Analyzer, VAX DEC/CMS, VAX DEC/Test Manager) support the DECwindows software environment, and provide either a DECwindows or a command line user interface.

The VAX Language-Sensitive Editor/Source Code Analyzer is an integrated environment that provides software professionals with editing, cross reference, and static analysis capabilities. It is a multi-language, multi-module, and multi-window tool that is useful for program design, development and maintenance.

For more information on the VAX Language-Sensitive Editor/Source Code Analyzer, the languages it supports, and its support for vector software development, refer to the Software Product Description (SPD 26.59).

The VAX Performance and Coverage Analyzer is a tool to help VMS users analyze the execution behavior of their application programs. The VAX Performance and Coverage Analyzer has two functions. First, it can pinpoint execution bottlenecks and other performance problems in application programs. Second, it provides test coverage analysis by measuring what parts of a user program are executed or not executed by a given set of test data.

For more information on the VAX Performance and Coverage Analyzer, including support for vector software development, refer to the Software Product Description (SPD 26.76).

VAX DEC/CMS (Code Management System) is a library system that facilitates the development and maintenance of software systems. Software systems are divided into different functional components that are, in turn, organized into sets of one or more files. During development, one or more programmers continually make changes to these files. VAX DEC/CMS helps manage the files during development (and later during maintenance) by storing the files in a project library, tracking changes, and monitoring access to the library.

For more information on VAX DEC/CMS, refer to the Software Product Description (SPD 25.52).

VAX DEC/MMS (Module Management System) is a software tool designed to enhance programmer productivity. It determines that components in a described software system have changed, and rebuilds the system in an optimal way.

For more information on VAX DEC/MMS, refer to the Software Product Description (SPD 26.03).

VAX DEC/Test Manager automates regression testing by executing user supplied tests and automatically comparing the results with the expected test results. VAX DEC/Test Manager gives the software engineer flexibility in organizing tests and in selecting tests for execution, and in verifying and reviewing test results.

For more information on the VAX DEC/Test Manager, refer to the Software Product Description (SPD 26.68).

VAXuisx and VWS Migration Tools Kit

SPD: 33.58
UPI: VAW

VAXuisx and VWS Migration Tools Kit allows most existing applications written for the VWS windowing system to run under the DECwindows windowing system. VAXuisx accomplishes this by providing a new runtime library that uses the Xlib program interface for drawing and input services. UIS routines are redirected to the new UISXSHR runtime image. Therefore, most applications do not need to relink or install native VWS.

XMedia Tools for RISC ULTRIX

SPD: 36.55
UPI: XUV (Tools Developer Kit)
XTP (Audio Developer License)
XTR (Video Developer License)
XTT (Audio Cluster License)
XTT (Software Media)
XUW (Tools Full Developer Kit)
XTP (Audio Developer License)
XTR (Video Developer License)
XTT (Audio Cluster License)
XTT (Software Media)
MB5 (Tools Runtime Kit)
LBD (Tools Runtime License)
XTQ (Audio Runtime License)
XTS (Video Runtime License)
MB4 (Software Media)

The Audio/Video Runtime Kit includes drivers, servers, sample applications, Software Motion Pictures and a few sample audio and video clips.

The Audio/Video Developer Kit adds on-line documentation, audio and video libraries, a more extensive audio clip library, and tools to the functionality found in the Runtime Kit.

Audio and Video Drivers provide support for the DECaudio and DECvideo TURBOchannel options as well as the built on audio in the Personal DECstation 5000.

The Audio Server allows multiple audio events, e.g., music, sound effects and spoken text to occur simultaneously. Its synchronization primitives allow commands and devices to be sequenced. They also prioritize audio resources among different clients. The Audio Server supports both DECaudio and MAXine's audio capabilities.

The Xv Video Extension to the X Server allows live video to be displayed in a workstation window. The DECvideo TURBOchannel option can convert a channel of analog video into a digital format (uncompressed) for display on a workstation. The extension attaches the digitized video frame to a user specified window and allows sharing of the screen between the video window and other windows.

NEXPERT OBJECT for ULTRIX Systems

SPD: 38.40
UPI: XSX (VAX systems—development)
YEN (VAX systems—runtime)
VWK (RISC systems—develoment)
YEP (RISC systems—runtime)

NEXPERT OBJECT for ULTRIX Systems is a software product developed by Neuron Data Systems, Inc. and licensed under Digital Equipment Corporation Standard Terms and Conditions.

NEXPERT OBJECT for ULTRIX is a powerful, workstation-based application development tool, which fully utilizes the graphic capability of a workstation. It is written in C, and integrates proven knowledge representation methodologies with powerful inferencing mechanisms. This facilitates the delivery of applications in a heterogeneous environment.

NEXPERT OBJECT uses Objects and Rules to represent knowledge. The user interface makes full use of color, windows and graphic networks, permitting the user to easily interact with the facts and rules in the system.

NEXPERT OBJECT supports sophisticated inference mechanisms, including integrated forward and backward chaining which allows the system to imitate the reasoning behavior of the expert. The user can also customize the reasoning strategies of the system as required. The explanation facility lets the user highlight the reasoning of the systems during any point in a session.

NEXPERT OBJECT supports direct calls to standard database architectures throughout the network via bridges provided by optional software. The user has the capability of filtering database queries. Processes/programs can be spawned by the applications the user builds, thereby combining conventional and expert system technologies.

VAX Decision Expert for VMS

SPD: 25.D5
UPI: VI2

VAX Decision Expert for VMS is a tool that assists programmers and engineers in building expert systems.

VAX Decision Expert has both development and delivery packages. The development package allows users to build expert systems by making selections from menus. Information can be shown in several ways: in a table format for entering if-then rules; a graphical editor for building and-or trees; and a graphical editor for building decision or procedural trees. VAX Decision Expert allows for both forward and goal chaining in the if-then table and and-or tree modules. The developer can control the search technique by setting probability and cost data so the system will search the most effective and least expensive route first. Also, the developer can control the search technique by using the utility language. The utility language is an underlying command language that provides the ability to perform functions that cannot be classified as if-then table, and-or tree, or decision tree functions (for instance, input/output or inference control structures).

The delivery or end-user package is a menu interface aimed at the end user with no computer experience. The screen is divided into two main parts, the procedure window and the history window. A pop-up menu window appears and the end user must choose a response from the menu in order to continue the session. Once the end user responds, both the question and the end user's answer are placed in the history window. The procedure continues until a solution is reached.

VAX LISP/ULTRIX

SPD: 27.05
UPI: 418

VAX LISP/ULTRIX is a full implementation of COMMON LISP, with the exception of complex numbers, the INSPECT function, and the ED (editor) function. With the exception of any operating system-specific feature, VAX LISP is source program compatible with VAX LISP/VMS.

VAX LISP/ULTRIX features a system building utility that allows a user to create a LISP program excluding those parts of VAX LISP not required for the program to execute and also allows users to create a single executable image that contains both the VAX LISP code necessary for the program to run and the user's code. This utility also makes programs shareable by multiple users.

Other features include an interactive user interface; fully lexically scoped variables so compiled and interpreted code execute identically; incremental compilation support for call out to compiled non-LISP routines written in languages that support the VAX calling standard; call out to X10 Graphics Library; user-definable I/O streams; user-controllable and extensible pretty printer; debugger, stepper, and tracer; alien structure mechanism for defining and manipulating non-LISP data structures; and user-controllable error handling.

VAX LISP/VMS

SPD: 25.82
UPI: 917

VAX LISP/VMS is a complete and extended implementation of COMMON LISP as defined by the book, *COMMON LISP: The Language,* by Guy L. Steele, Jr. It runs on the VAX family of computers using the VMS Operating System. For workstations, VAX LISP/VMS supports both DECwindows (XUI toolkit and X11 graphics) and VWS graphics.

VAX OPS5

SPD: 27.04
UPI: 913 (Development)
MKL (Compiler only)

VAX OPS5 is a high-performance implementation of the OPS5 language as described in the *OPS5 User's Manual* by Charles L. Forgy, Department of Computer Science, Carnegie-Mellon University. VAX OPS5 is a tool for developing commercial quality rule-based systems. It provides a DECwindows-based development environment that integrates the steps required to create, run, debug, and revise VAX OPS5 programs.

The VAX OPS5 runtime system sequences through all productions in a system in the recognize-act cycle. Production systems written in VAX OPS5 call routines written in other VMS languages. Those routines, in turn, call the OPS5 system. VAX OPS5 supports routines for Ada, BASIC, BLISS-32, C, FORTRAN, and Pascal.

VAX OPS5 consists of a compiler, a runtime system, and an optional development environment. The compiler is incremental and creates the Rete Network. This network eliminates redundant tests that would otherwise be performed in an exhaustive pattern-matching or inference operation. The compiler translates the Rete Network into position-independent VAX instructions, and the output is a standard object module that can be linked into VMS executable or shareable images.

(Continued)

VAX OPS5 *(Continued)*

The runtime system is a suite of routines that form part of an application's running image. All routines reside in memory and can be shared among users. It also includes a command interpreter that adds to user control of running VAX OPS5 programs and other service routines. Features include runtime system support routines for interfacing to routines written in other VMS languages; BUILD command for incrementally compiling a startup, production, or catcher into a running program; and a RESTART command for resetting execution context and reexecuting the startup.

The development environment lets users create or modify source code, then test, debug, and correct the altered program with the new instructions in effect. Features include a standard DECwindows interface with user-customizable options; an integrated text editor; one or more trace windows; one-to-one correspondence between modules and VMS files; single-user system with temporary and permanent source code databases; task-oriented and context-sensitive online help; and the ability to use any bitmapped graphics display that supports DECwindows. It also can execute standalone on a VAXstation or in DECwindows client and server mode.

3270 Terminal Option Software

SPD: 25.G5
UPI: VV9

3270 Terminal Option Software is the operational firmware that is downline loaded to a CXM04-* communication option card for the DECserver 550 terminal server only. It allows supported 3270-type terminals attached to a CXM04 option card to interactively access host-based applications while continuing operation with an IBM host. This same ability is provided for PCs properly configured with one of the supported packages that emulate 3270-type terminals.

3270 Terminal Option Software controls terminal port characteristics and the IBM session support. The 3270 user can have access to both service nodes (hosts) and IBM host applications. A hot-key sequence toggles users from the IBM session to the VMS session. The system interprets VT220 escape sequences and translates them to 3270 coax commands that are sent to the IBM 3270 display. The software also reads keystrokes and performs the reverse translation.

A set-up menu selection similar to the VT220 set-up menu lets users define terminal characteristics as needed. The 3270 Terminal Option Software is down-line loaded over the network from a Phase IV DECnet load host.

DEC Commserver for VMS

SPD: 33.21
UPI: GCQ

DEC Commserver for VMS is a layered software product that allows VMS host systems to communicate with suitably configured server systems over the Ethernet. The DEC Commserver for VMS software package is composed of both host and server functional components. The host components include an Application Interface Driver that implements the Simpact Associates application programming interface (API); a host transport driver which interfaces to the system's Ethernet Driver; and configuration and management drivers.

The DEC Commserver's application interface driver permits users to utilize their existing Simpact applications as if the Simpact hardware (ICP1622) were installed in the host. Application programs are able to perform $QIO requests to the DEC Commserver's host transport driver—all transparent to the host application.

DEC Commserver for VMS can be configured to interface with multiple servers and conversely, servers can be configured to interface with multiple hosts. Any combination of host and server connections can be made up of a maximum configuration of 31 hosts and/or 31 servers on a single LAN. Users must follow configuration and performance guidelines, since the total number of communications lines supported is a function of line speeds and line utilization. The server components within DEC Commserver for VMS include commserver transport driver, transfer application, management and device processes, VAXELN operating system, and communication protocols.

Simpact Associates software protocols for the DEC Commserver are supported by Digital when purchased with the DEC Commserver for VMS software.

DEC Computer Integrated Telephony Applications Interface for ULTRIX

SPD: 34.25
UPI: GMU (RISC)
GMV (VAX)

DEC Computer Integrated Telephony Applications Interface for ULTRIX allows applications to establish and control logical communications channels to devices attached to a CIT-compatible PBX.

These channels can be used for basic call processing such as making and accepting telephone calls, additional call processing such as transferring and conferencing calls, and Monitoring the status of telephones.

CIT Applications Interface for ULTRIX routines also allow the programmer to establish communications channels with one or more DECvoice modules.

A DECvoice module provides a voice response unit that can be used for voice digitization (recorded voice) and voice synthesis (text-to-speech synthesis). For example, messages re recorded over a telephone and the voice synthesis converts text messages to speech. Using CIT routines, the DECvoice module can also make, answer and hangup telephone calls, and generate and recognize tones on the telephone line.

DEC CIT Applications Interface for ULTRIX passes the application's requests to Digital's CIT Server software, which must be installed on a VAX/VMS system or a DEC MicroServer connected to a CIT-compatible PBX over a synchronous communications link. Refer to the DEC CIT Server for VMS Software Product Description (SPD 29.91.xx) and the DEC CIT Server 100/500 Software Product Description (SPD 36.33) for more information.

DEC Computer Integrated Telephony Applications Interface for VMS

SPD: 29.92
UPI: VGX

DEC Computer Integrated Telephony Applications Interface for VMS is a software product which provides programmers with an applications interface comprising a library of VMS routines. These routines allow the applications programmer to establish and control logical communications channels between a user process on a VAX and devices attached to a CIT compatible PBX.

DEC Computer Integrated Telephony Server 100/500

SPD: 36.33
UPI: XNQ

DEC Computer Integrated Telephony Server 100/500 provides users with access to CIT-compatible voice-switches for applications using the CIT Applications Interface. The CIT Applications Interface allows applications to establish and control logical communication channels between the appli-cation and devices attached to the CIT-compatible switches. These channels can be used to control basic call processing such as making and accepting telephone calls, additional call processing such as transfer and conference calls, and monitoring the status of the devices.

DEC Reliable Transaction Router (RTR) for VMS

SPD: 34.30
UPI: XNK (Backend)
XNL (Frontend)

DEC Reliable Transaction Router (RTR) for VMS is the implementation of the Reliable Transaction Router on VMS. It is a reliable, transparent, message routing system that includes both a transactional and non transactional message control system. DEC RTR implements automatic application software fault tolerance and failure recovery on the VMS operating system by adapting to hardware (CPU), communications, and application software failures. DEC RTR for VMS provides the users the ability to easily partition multiple application programs over DECnet Local Area Networks (LANs) and Wide Area Networks (WANs). Ease of development features include both a Requester (Client)/Server design environment, with optional all-or-nothing transaction semantics, as well as a message broadcasting facility. DEC RTR implements virtual, rather than physical, networks which provide the application developer with a "single view" of a distributed client/server environment. This technique allows the application software to be independent of physical hardware (CPU) location, network naming conventions, and communications protocol.

DEC RTR for VMS is implemented by providing the programmer with nine system services to develop distributed applications. This call interface conforms to the VMS calling standard. In addition to the standard system service call interface, DEC RTR for VMS includes a run-time library (RTR RTL) for the VMS language family to facilitate application development in high level programming languages. The RTR call interface functions are also made available at the Digital Command Language (DCL) level in both their synchronous and asynchronous forms.

DEC RTR for VMS provides application software Fault Tolerant features such as shadow-server processing, standby-server processing, and callout servers to implement user authentication control, as well as concurrent servers with dynamic message queue load balancing for high performance. The high performance transactional messaging is implemented as a full-duplex, conversational remote procedure call (RPC) using real-time flow control techniques. These features generally require no special user application programming logic.

The System Management interface allows the dynamic creation, deletion, and monitoring of multiple, independent virtual networks within a network. In addition, the monitoring utility can be invoked from any system, with suitable privileges, to gather and report distributed application performance statistics. The DEC RTR for VMS System Management interface is used to bind the physical hardware (CPU and communications) to a virtual network namespace and is completely transparent to the application software. Several levels of physical and logical security can be controlled via the System Management interface. Additional security is provided at run-time through the RTR call interface.

DEC RTR for VMS is both forms/window management systems and database independent. Application server features allow transaction consistent access to Digital and non-Digital database products within the same network-wide distributed transaction.

DEC RTR for VMS is primarily intended for production systems in large distributed environments that require frontend forms independence and backend server database independence (e.g., trading/money dealing systems, telecommunication systems, etc.). DEC RTR for VMS can also be used in general distributed transaction systems that require reliable messaging and fault tolerant application control over local and/or wide area networks. DEC RTR for VMS provides the enabling technology for applications requiring fully distributed client-server models rather than a distributed database model.

DEC Sound/Picture Information Network (DECspin) for ULTRIX

SPD: 37.21
UPI: MD9

DEC Sound/Picture Information Network (DECspin) for ULTRIX layered software product provides video and audio conferencing, using standard network protocols, among users of the DECmedia base software and hardware environment.

The application operates on top of ULTRIX Worksystem Software and XMedia and requires DECvideo and DECaudio hardware options in order to function properly.

DEC X.25 Access for ULTRIX

SPD: 26.E6
UPI: YP3 (VAX)
GTE (RISC)

DEC X.25 Access for ULTRIX is a layered ULTRIX software product which allows an ULTRIX/UWS system to connect to an X.25 network. It provides the following functions: support for TCP/IP over an X.25 network; an Application Programming Interface; X.29 server capability; and a PAD facility to allow ULTRIX users to communicate with remote Data Terminal Equipment (DTEs) over a PSDN.

DEC X.25 Native Mode for ULTRIX

SPD: 32.35
UPI: YSZ (VAX)
YSY (RISC)

DEC X.25 Native Mode for ULTRIX is an ULTRIX layered product that allows suitably configured ULTRIX systems to connect to Packet Switching Data Networks (PSDNs) conforming to CCITT recommendation X.25 (1980, 1984, or 1988) and/or to International Standard (ISO) 8208. Refer to the System Support Addendum (SSA 32.35.00-x) for the list of public PSDNs on which DEC X.25 Native Mode is supported.

The product enables process-to-process and terminal communications between a VAX or RISC-based Digital system and remote Data Terminal Equipment (DTE) in a PSDN supporting the ISO or X.25 interface protocols, or direct connection to equipment acting as Data Circuit Terminating Equipment (DCE) using the ISO protocols, or to any combination of PSDNs and equipment subject to the limitations noted below.

DEC X.25gateway 100/500

SPD: 32.97
UPI: YT8

DEC X.25gateway 100/500 is a software product that runs on either the DEC MicroServer (DEMSA) or DEC MicroServer-SP (DEMSB) hardware unit. It provides both Digital and non-Digital X.25 systems with connections to X.25 Packet Switched Data Networks (PSDNs) and provides X.25 relay and switching capabilities locally for both Digital and non-Digital X.25 systems. The combined hardware/software packages are known as the DEC X.25gateway 500 and DEC X.25gateway 100 respectively.

DEC X.400 Mail System for ULTRIX

SPD: 31.32
UPI: YW1 (VAX)
YW2 (RISC)

DEC X.400 Mail System for ULTRIX is a layered OSI application which provides an X.400 communication path to other X.400 Message Transport Systems. It is a full CCITT 1984 Message Handling System and allows users to exchange messages with users of other X.400 mail systems. It consists of a P1-compliant Message Transfer Agent (MTA), a P2-compliant User Agent, submission and delivery daemons, and the Reliable Transport Server (RTS).

DECmessageQ for MS-DOS

SPD: 34.06
UPI: GHR

DECmessageQ for MS-DOS is the MS-DOS release of the DECmessageQ message queuing bus software. It implements a subset of the DECmessageQ application programming interface that provides easy-to-use, efficient task-to-task communications among VMS, ULTRIX, OS/2, and MS-DOS processes.

A common call interface allows messages to be delivered to processes attached to the DECmessageQ queue bus. Applications can be designed so program modules can be redeployed easily anywhere within the network, whether in a standalone node, a Local Area Network (LAN), or a wide area network.

The DECmessageQ for MS-DOS communication implementation is designed for ease-of-use, expandability, and efficiency. Its features include remote message delivery via DECnet-DOS, message broadcasting using selective broadcast services (SBS), message capture facility for use in application testing, set of message delivery options, language support for C, portable call interface, and connectivity to DECmessageQ implementations on VMS, ULTRIX, OS/2, and MS-DOS.

DECmessageQ for ULTRIX

SPD: 34.08
UPI: GHU (VAX)
GHT (RISC)

DECmessageQ for ULTRIX is the ULTRIX release of the DECmessageQ message queuing bus software. It implements a subset of the DECmessageQ application programming interface that provides easy-to-use, efficient task-to-task communications among VMS, ULTRIX, OS/2, and MS-DOS processes.

A common call interface allows messages to be delivered to processes attached to the DECmessageQ queue bus. Applications can be designed so program modules can easily be redeployed anywhere within the network, whether in a standalone node, a Local Area Network (LAN), or a wide area network.

DECmessageQ for UNIX

SPD: 39.25
UPI: MK6 (ULTRIX RISC development)
MKC (ULTRIX RISC runtime)
MK5 (ULTRIX VAX development)
MKB (ULTRIX VAX runtime)
MK8 (HP-UX development)
MKE (HP-UX runtime)
MK7 (System V/88 development)
MKD (System V/88 runtime)

DECmessageQ for UNIX is the UNIX operating system implementation of a generic software message queuing bus that provides easy-to-use, efficient task-to-task communications among processes using DECmessageQ on ULTRIX/RISC, ULTRIX/VAX, HP-UX, and SYSTEM V/88.

A common call interface allows messages to be delivered via local interprocess communications for intra-CPU applications, or via Transmission Control Protocol/Internet Protocol (TCP/IP) for inter-CPU applications. Applications can be designed so client applications can be redeployed easily anywhere within the DECmessageQ network configuration, whether in a standalone node, a Local Area Network (LAN), or a wide area network.

DECmessageQ for VMS

SPD: 34.07
UPI: GKP (Development)
GHV (Runtime)

DECmessageQ for VMS is the VMS operating system implementation of a generic software message queuing bus that provides easy-to-use, efficient task-to-task communications among processes using DECmessageQ on VMS, ULTRIX, MS-DOS, and OS/2.

A common call interface allows messages to be delivered via high-speed global sections for some intra-CPU applications, or via DECnet-VAX for inter-CPU applications. Applications can be designed so client applications can be redeployed easily anywhere within the DECmessageQ network configuration, whether in a standalone node, a Local Area Network (LAN), or a wide area network.

DECndu (Network Device Upgrade) Utility for ULTRIX

SPD: 33.48
UPI: YX2 (FDDI DECconcentrator 500)
YX3 (FDDI DECbridge 500)
XA2 (FDDIController)

DECndu (Network Device Upgrade) Utility for ULTRIX allows users, at a host in an "Extended LAN," to upgrade the existing version of software within the DECbridge 500 and DECconcentrator 500.

The DECbridge 500 and DECconcentrator 500 are FDDI products which ship from the factory with the software preloaded. The software resides in electrically alterable memory within the hardware, and is updated via the DECndu Utility.

DECndu upgrades the existing version of software in the DECbridge 500 and DECconcentrator 500 via the "Extended LAN." An "Extended LAN" is a collection of LANs (Local Area Networks) that are interconnected and logically appear as one large Local Area Network.

General characteristics of the DECndu Utility are: it installs and resides on a host in the LAN; it loads the new device software from the host into electrically alterable memory within the hardware device where it will remain; it verifies that the load was successful.

DECndu (Network Device Upgrade) Utility for ULTRIX/VAX

SPD: 36.34
UPI: YX2 (FDDI DECconcentrator 500)
YX3 (FDDI DECbridge)

DECndu (Network Device Upgrade) Utility for ULTRIX/VAX allows users, at a host in an "Extended LAN," to upgrade the existing version of software microcode within the DECbridge 500 and DECconcentrator 500.

The DECbridge 500 and DECconcentrator 500 are FDDI products which ship from the factory with the software microcode preloaded. The software microcode resides in electrically alterable memory within the hardware, and is updated via the DECndu Utility.

DECndu upgrades the existing version of software microcode in the DECbridge 500 and DECconcentrator 500 via the "Extended LAN." An "Extended LAN" is a collection of LANs (Local Area Networks) that are interconnected and logically appear as one large Local Area Network.

DECndu (Network Device Upgrade) Utility for VMS

SPD: 33.47
UPI: YX2 (FDDI DECconcentrator 500)
YX3 (FDDI DECbridge 500)

DECndu (Network Device Upgrade) Utility for VMS allows users, at a host in an "Extended LAN," to upgrade the existing version of software within the DECbridge 500 and DECconcentrator 500.

The DECbridge 500 and DECconcentrator 500 are FDDI products which ship from the factory with the software preloaded. The software resides in electrically alterable memory within the hardware, and is updated via the DECndu Utility.

DECndu upgrades the existing version of software in the DECbridge 500, and DECconcentrator 500 via the "Extended LAN." An "Extended LAN" is a collection of LANs (Local Area Networks) that are interconnected and logically appear as one large Local Area Network.

General characteristics of the DECndu Utility are: it installs and resides on host in the LAN; it loads the new device software from the host into electrically alterable memory within the hardware device where it will remain; and it verifies that the load was successful.

DECnet/OSI for ULTRIX

SPD: 34.97
UPI: 716 (VAX ULTRIX systems)
YT9 (RISC ULTRIX)

DECnet/OSI for ULTRIX, is a Phase V end-node implementation of the Digital Network Architecture (DNA) for the ULTRIX operating system and ULTRIX Worksystem Software (UWS) for VAX and RISC systems. DNA Phase V Enables Digital systems to participate in multivendor networks that adhere to the Open Systems Interconnection (OSI) specifications as defined by the International Standards Organization (ISO). It also Supports increased network sizes through the use of the ISO addressing capability, as well as providing the ability to manage very small to very large multivendor networks through the use of a network management entity model that is modular and extensible.

The DECnet/OSI for ULTRIX software enables communication among and access to the resources of different, networked Digital systems that use the DNA Phase V or Phase IV protocols or non Digital systems that use the ISO OSI protocols. With proper network planning, DECnet/OSI for ULTRIX nodes can participate in multivendor networks with unlimited numbers of nodes. At the same time, users and user programs can communicate with non Digital systems that use the Internet (TCP /IP-based) protocols. Mixing protocols may limit the functions available across the network.

DECnet/PCSA Client: VAXmate

SPD: 55.10
UPI: 0N7

DECnet/PCSA Client: VAXmate allows selected personal computers to be connected to VAX, MicroVAX, or VAXmate computers in a DECnet network, use facilities and services of those systems, and access information and services contained on other Digital systems in the DECnet network.

Personal Computing Systems Architecture (PCSA) is an extension of Digital's systems and networking architecture that merges VMS and MS-DOS environments. The graphical interface is an adaptation of MS-Windows, and the network software is based on an adaptation of MS-NET.

DECnet/PCSA Client: VAXmate provides VAXmates with access to network services, remote boot capability, an operating system, a user interface, terminal emulation, online user information, printer support, and all DECnet-DOS facilities.

DECnet/SNA VMS Gateway Management

SPD: 29.70
UPI: VCK

DECnet/SNA VMS Gateway Management provides configuration and management functions for use with DECnet/SNA Gateway for Synchronous Transport and DECnet/SNA Gateway for Channel Transport. These two gateway products are designed to allow users to exchange information and share resources bidirectionally between suitably configured Digital systems in a DECnet environment and IBM systems in a Systems Network Architecture (SNA) environment.

DECnet/SNA VMS Gateway Management allows the gateway administrator to configure the software executing in the Synchronous Transport or the Channel Transport system. This software lets the administrator set up parameters relating to lines, circuits, physical units, logical units, and other key variables necessary for network-to-network communications between the DECnet and SNA networks. The administrator can also manage and diagnose problems related to the DECnet/SNA Gateway.

DECnet/SNA VMS Gateway Management permits Digital system operators to bootstrap or restart a DECnet/SNA Gateway remotely and provide configuration and initialization facilities for the DECnet/SNA Gateway.

This software provides event logging and error counters as well as a range of fault isolation tools. These fault isolation tools include a trace capability to help debug application programs and identify system problems, a "snapshot" monitoring utility to display the status of Gateway buffer availability and the number of SNA sessions in progress, and memory imaging for irrecoverable errors.

DECnet-ULTRIX for RISC and VAX

SPD: 26.83
UPI: 716

DECnet-ULTRIX for RISC and VAX is a Phase IV end-node implementation of Digital Network Architecture (DNA) for the ULTRIX operating system and ULTRIX Work-system Software (UWS) for VAX and RISC systems.

The DECnet-ULTRIX software enables communication among different, networked Digital systems that use the DNA Phase III/IV* protocols. DECnet ULTRIX allows ULTRIX users and users' programs to access the resources of Phase IV DECnet networks. With proper network planning, DECnet-ULTRIX nodes can participate in DECnet networks with up to 1023 nodes per area and up to 63 areas per network. At the same time, users and user programs can communicate with non-Digital systems that use the Internet (TCP/IP based) protocols.

DECnet-ULTRIX offers the following capabilities: task-to-task communications, network virtual terminal, remote file transfer, mail, coexistence with the Internet protocols (TCP/IP-based), and network-wide resource sharing and management as defined by the DNA protocols. DECnet ULTRIX can communicate with and is warranted for use only with other Digital Phase III/IV* DECnet products.

(Continued)

DECnet-ULTRIX for RISC and VAX *(Continued)*

The network functions available to a DECnet-ULTRIX user depend, in part, on the configuration of the rest of the network. Each DECnet product offers its own functions and its own set of features to the user. Networks consisting entirely of DECnet-ULTRIX Phase IV nodes have all the functions described in this Software Product Description (SPD). Networks that combine DECnet-ULTRIX nodes with other DECnet products may limit the functions available to the DECnet ULTRIX user, because some DECnet-ULTRIX features may not be supported by all DECnet products. Conversely, a user of another DECnet implementation will not necessarily have access to all DECnet-ULTRIX functions. The DECnet products and functions available to users on mixed networks can be determined by comparison of the SPDs for the appropriate products.

DECnet-VAX

SPD: 25.03
UPI: D04 (End-node)
D05 (Full-function)
D09 (migration option)

DECnet-VAX allows a suitably configured VMS system to participate as a routing or end node in DECnet computer networks. With proper network planning, DECnet-VAX networks can contain up to 1023 nodes per network area and up to 63 areas per network. DECnet-VAX interfaces are standard components of VMS for use on a local standalone system.

DECnet-VAX end node and full function products are licensed separately for VMS. The DECnet-VAX License Product Authorization Key (PAK), when registered on a VMS system, enables communication between different networked systems that use the same protocols.

DECnet-VAX is a Phase IV network product and is warranted only for use with Phase III and Phase IV products supported by Digital Equipment Corporation.

DECnet-VAX offers task-to-task communications, file management, downline system and task loading, network command terminals, and network resource sharing capabilities using the Digital Network Architecture (DNA) protocols. DECnet-VAX communicates with adjacent and non-adjacent Phase III and Phase IV nodes(adjacent nodes are connected by a single communications line).

VMS programs written in VAX MACRO and native mode high-level languages can use DECnet-VAX capabilities, but programs executing in PDP-11 compatibility mode cannot use DECnet-VAX.

The network functions available to a DECnet-VAX user depend, in part, on the configuration of the rest of the network. Each DECnet product offers its own subset of Digital Network Architecture (DNA) functions and its own set of features to the user. Networks consisting entirely of DECnet VAX Phase IV nodes have all the functions described in this Software Product Description (SPD). Networks that combine different DECnet implementations may limit the functions available to the DECnet-VAX user on non-DECnet-VAX nodes since other DECnet implementations may not implement certain functions. Similarly, a user of another DECnet implementation may not be able to access all DECnet-VAX functions.

DECnet-VAX Extension

SPD: 29.03
UPI: D04

DECnet-VAX Extension software provides additional services for DECnet-VAX. Use of these services is licensed under the DECnet-VAX license.

The DECnet-VAX Extensions offers the following enhancements to DECnet-VAX Version: DECnet-VAX use of the VAX Distributed Name Service for node names and addresses. OSI stack with support for: File Transfer, Access and Management (FTAM); Association Control Service Element (ACSE); Presentation; Session; Transport; Connection Oriented Network Service (CONS) and Connectionless Network Service (CLNS) networks over Ethernet and X.25; Network management using the Network Control Language; Tools for easy node name management and for network management support.

The DECnet-VAX DNS extension supports the optional use of the VAX Distributed Name Service (DNS) namespace to store node names and addresses for DECnet-VAX. To access node information, a DECnet-VAX node can use the local DECnet node name database, the DNS namespace, or both.

A node name management tool helps users helps users with names-pace management tasks such as registration of existing node names and addresses and the creation, modification, and deletion of node names and associated information.

Digital's Distributed Time Service (DECdts) provides a precise, fault-tolerant clock synchronization for systems in a local and wide area network.

The DECdts clerk and server are included in the DECnet-VAX Extensions kit. The DNS clerk is included in the VMS kit. Use of the namespace by DECnet-VAX requires at least one DNS server in the network.

DEComni/VMS (Digital's OSI Manufacturing Network Interconnect)

SPD: 32.32
UPI: YME

DEComni/VMS (Digital's OSI Manufacturing Network Interconnect) is a network communication product and is an implementation of the Manufacturing Message Specification, MMS, ISO 9506-1 and ISO 9506-2. When combined with prerequisite hardware and software, DEComni/VMS interoperates with other systems supporting the Manufacturing Message Specification ISO IS/9506-1 and ISO IS/9506-2 specification.

The conformance of DEComni/VMS software to OSI standards is specified in Appendix A of Software Product Description 32.32.

DEComni/VMS is an implementation of the Manufacturing Message Specification, MMS, ISO 9506 consisting of a callable interface on VMS which will take the proper arguments and transform them into the proper MMS protocol.

DEComni/VMS provides as a minimal set, the Client Conformance requirements for the services specified in MAP Implementation Class MAP2. DEComni/VMS additionally provides 28 services above those specified in MAP Implementation Class MAP2.

The product may interoperate with those device vendors that have implemented to ISO IS/9506(MMS).

DEComni/VMS provides a high level applications programming interface (API) with a high degree of functionality built in. The interface is easy to use and requires very little support code.

DECvoice Software

SPD: 29.97
UPI: VFU

DECvoice Software provides a programming interface to the DECvoice hardware (DTCO4 and DTCN5/DTCO5 options). The DECvoice hardware and software has been designed to allow access to the North American telephone network by voice applications on a VAX platform.

DECwindows DECnet/SNA 3270 Terminal Emulator for ULTRIX

SPD: 31.57
UPI: VXA

DECwindows DECnet/SNA 3270 Terminal Emulator for ULTRIX (DW ULTRIX 3270 TE) is a layered software product that allows users of Digital supported workstation environments, on suitably configured ULTRIX systems within a DECnet network, to interactively access IBM mainframe-based applications.

Translation tables on the respective systems convert ISO Latin terminal input to a subset of IBM multinational EBCDIC code for transfer through the DECnet/SNA gateway software. These translation tables can be modified to fit most language needs.

If customized, DW ULTRIX 3270 TE can be invoked by users from an ULTRIX User Executive (UE) applications menu or an ULTRIX command line. When DW ULTRIX 3270 TE is invoked from the UE applications menu, DW ULTRIX 3270 TE options are specified in a DECwindows dialog box. When DW ULTRIX 3270 TE is invoked from an ULTRIX command line, command line qualifiers are used to specify the IBM system and system resources to which the user wishes to connect. While the emulation utility is operating, the display window will be formatted similar to a 3270 display station with the option of 3270, 3279-S3G, or 3192-G terminal types. When the user has completed work on the IBM system, the 3270 Terminal Emulator is dismissed and control is returned to the ULTRIX command level or to the UE utility.

An online HELP facility provides information about key functions. The operator information area as implemented on an actual 3270 display is not supported; however, much of the same information is reported by means of status indicators where the status line is displayed. In addition, the user has the ability to redefine certain IBM key functions to different keys of the workstation keyboard.

Internet Portal

SPD: 31.61
UPI: VZS

Internet Portal is a server running on dedicated hardware configured as a DNA Phase IV/IV+ end system and an IP gateway. It provides TCP/IP connectivity in an existing DECnet environment.

IP hosts forward IP datagrams destined for a remote host to the Internet Portal. The portal encapsulates the IP datagram into DECnet packets and forwards these to another portal located in another portion of the DECnet wide-area network. The packets are then passed to a DECnet router for transport over the network backbone.

The DECnet backbone configuration does not affect enveloped IP datagram transfer to the receiving portal, where the DECnet envelope is removed and the original IP datagram is sent on to the receiving TCP/IP host. The DECnet networking protocol is responsible for the packet routing through the network.

Internet Portal conforms to the DECnet end-node description in the DNA Phase IV/IV+ routing specification and internet standards.

LAN Traffic Monitor VMS

SPD: 27.80
UPI: VEH

LAN Traffic Monitor VMS is the software portion of a fully distributed monitor that supports the capture and presentation of traffic data from an extended Ethernet. A LAN Bridge 100 or LAN Bridge 150, downline loaded with monitoring software, is attached to the Ethernet cable and transmits information to a VMS layered application software program. The program can be located on any VAX computer in the extended LAN. Multiple users from different nodes on the extended Ethernet can access the traffic data.

LAN Traffic Monitor contains the LTM Listener software, which counts and classifies Ethernet traffic using a LAN bridge as a monitoring device. It also contains the LTM User Interface, which collects and displays data received from the LTM Listener.

Users interface with the application software through a menu structure and can display the status and operational parameters of the LTM Listener and LTM User Interface. The menu structure allows the VMS DCL process to be spawned and the terminal to be detached from the LTM application.

Remote System Manager

SPD: 29.59
UPI: B13 (VMS Server)
B14 (VMS Client)
VWW (ULTRIX/VAX Client)
GUX (ULTRIX/RISC Client)

Remote System Manager (RSM) is a VMS and ULTRIX layered product that permits a system manager to manage a number of computer systems efficiently.

RSM uses the DECnet network to automate the recurring system management tasks of Software distribution and installation (both operating systems (VMS only) and applications); File backup and restore and system administration (VMS systems only).

ULTRIX Mail Connection

SPD: 29.05
UPI: VFG

ULTRIX Mail Connection is a layered ULTRIX application that provides enhanced mail services for ULTRIX systems. It forms the link between the ULTRIX mail systems and the MAILbus user agents and gateways through a connection with VAX Message Router.

ULTRIX Mail Connection provides effective direct access between ULTRIX sendmail and VAX Message Router.

VAX 2780/3780 Protocol Emulator

SPD: 25.07
UPI: 111

VAX 2780/3780 Protocol Emulator emulates the synchronous line protocol used by an IBM 2780 or 3780 remote batch terminal. The emulator provides the VMS user with a mechanism for transferring data between the VMS operating system and another system equipped to handle 2780 or 3780 communications protocols.

The emulator can be invoked interactively or by a command procedure. The emulator's command set is designed to let several users share a communications line. With the appropriate modem options, the emulator is capable of automatically answering incoming calls.

Sophisticated operations can be performed by a combination of command procedures, allowing, for example, unattended operation. This would include the capability to detect an incoming call, establish the connection, transmit and receive files, and recover from transmission failures, all without the intervention of an operator.

Several data formats are supported and a particular format is selected through user command. Users can select various forms control translation schemes, variable record lengths or card images, ASCII/EBCDIC translation, and BSC transparency. All file I/O is performed through the VMS record management facility. Data can be sent to files representing print and punch streams. The format of data sent to one stream can differ from the format of data sent to the other stream.

VAX 3271 Protocol Emulator

SPD: 25.21
UPI: 112

VAX 3271 Protocol Emulator (PE) enables VT1XX, VT2XX, and VT3XX terminals and VMS applications programs to interact with IBM system applications programs and system services that utilize the Binary Synchronous Communications (BSC) line protocols.

The application program interface provides a base for distributed applications where one component of the application runs on an IBM host system and the other component runs on a VMS system. This application is used for online access and update of a mainframe database in response to an event on the VAX computer, or where it is inappropriate to present 3270 type formatted screens to users accustomed to VMS-style screens.

This product includes the 3270 Terminal Emulator (TE) utility which transmits a screen display from the IBM system and displays it on a Digital terminal screen in a manner similar to the format on a 3270 display. This utility maps the VTXXX to simulate the 3270 keyboard. The TE facility is also supported for the VMS user of other Digital products running in VT1XX and VT2XX emulation mode.

A HELP facility provides information on keys with altered 3270-oriented functions and other functions such as the display of status information.

VAX Computer Integrated Telephony Server

SPD: 29.91
UPI: VGY

VAX Computer Integrated Telephony server (CIT) is a software product which provides functional integration between Digital Equipment Corporation's computing environment and a CIT-compatible PBX.

VAX DEC/MAP

SPD: 27.66
UPI: VFZ

VAX DEC/MAP is a network communication product that implements layers of the Open Systems Interconnection (OSI) reference model. When combined with prerequisite hardware, VAX DEC/MAP interoperates with other systems that support the Manufacturing Automation Protocol (MAP), version 3.0 specification.

The MAP network architecture specifies the protocols and services for seven layers: physical, datalink, network, transport, session, presentation, and application. This software implements layers three through seven, the network layer through the application layer. Layers one and two, the physical and datalink layers, are provided by the requisite hardware.

The network and the transport layers provide end-to-end transfer of data between cooperating applications on open systems. The session layer supports a dialog between presentation entities using full-duplex functionality, check pointing, and resynchronizing capabilities. The presentation layer negotiates transfer syntaxes and performs local syntax to transfer syntax conversion for the exchanging of data. The application layer provides the user interface to the communication services provided by the MAP network. It consists of File Transfer, Access, and Management (FTAM); Association Control Service Elements (ACSE); and VAX DEC/MAP Directory Service (MDS) through the VAX DEC/MAP Application Programming Interface (MAPI).

VAX DEC/MAP conforms to OSI and MAP standards. Users are provided with application interfaces for communicating with other systems on the network. A network management facility for control of the local node, VAX DEC/MAP Network Management, is designed to provide local network management for the host. Functions consist of management for layers one through seven, directory services, tracing, logging, and local events.

VAX Distributed File Service

SPD: 28.78
UPI: VEQ

VAX Distributed File Service (DFS) is a DECnet-VAX layered product that provides VMS users with the ability to use remote VAX VMS disks as if they were directly attached to the local VAX system.

DFS provides users and applications with transparent, high performance file access while using less CPU resources than standard DECnet-VAX file access.

DFS systems can act as "servers" or "clients" or both. Servers make file resources available to clients. The resources can vary in scope from a master file directory with all of the subordinate directories and files on a disk volume to an individual file. The DFS server gives the resource a unique name and registers it with the VAX Distributed Name Service (DNS).

The DFS client can then use the resource by means of the DFS MOUNT command. This command specifies the DNS name by which the resource was registered, enables communication between the client and the server, and creates a pseudodevice on the client system. This pseudodevice makes the remote resource appear to the local system like a local disk. Users can then perform operations on the pseudodevice, and DFS handles all of the network access and translation.

VAX Distributed Name Service is a prerequisite product. In order to use DFS, there must be at least one DNS server in the network. DNS allows the name of the resource to be independent of its physical location on the network. DFS systems throughout the network can continue accessing a resource even if the resource location is changed.

A DFS license is required on each VAX VMS server node that registers available directories or files and on each client node that uses the directories or files.

VAX Distributed Name Service

SPD: 28.79
UPI: VER

VAX Distributed Name Service (DNS) provides selected DIGITAL products with a DECnet-wide name-to-attribute mapping service.

DNS presents and maintains a consistent, network-wide set of names for network resources, called the namespace. These names are constructed without including any location information in them, thus permitting users to reference these network resources independent of their physical location.

A single DNS node can provide a DECnet-wide name service. DNS can be installed on additional nodes in a network to provide availability and performance benefits. As a general rule, it is suggested that DNS be placed on two nodes in each local area network. This should provide adequate performance and redundancy for most networks.

The VAX Distributed Name Service is used by selected DIGITAL products only, as noted in their SPDs.

VAX FTAM (File Transfer, Access, and Management)

SPD: 29.86
UPI: VFW

VAX FTAM (File Transfer, Access, and Management) is a communications product for copying files between open systems, deleting files on open systems, renaming files on open systems, and displaying information about files on open systems.

VAX FTAM implements several standards including the File Transfer, Access, and Management service element; the Association Control service element (ACSE) of the Application layer; the Presentation layer; the Session layer; and the Transport and Network layers. The Transport implementation (VOTS) is shipped as part of VAX FTAM on separate media and with separate documentation. Use of the VOTS programming interface is not supported under VAX FTAM.

Features include OSI layers implementation, VAX FTAM user facilities, support for several file types, flexible and transparent access for local files, RMS style format for file specifications, support for any file naming convention, and management and problem determination tools. Other features include VAX FTAM component software, directory requests, VAX FTAM DCL interface, VAX FTAM Installation Verification Program, VAX FTAM Control Program, VAX FTAM tracing utility, VAX FTAM event logging, and VAX FTAM messages.

VAX ISDN

SPD: 31.23
UPI: VZ9

VAX ISDN communication software product allows suitably configured VMS systems to connect to ISDN networks based on the corresponding CCITT recommendations via a Basic Rate Access. Connections are established using the circuit-switched access of the ISDN networks.

VAX ISDN is a VMS layered product that provides circuit-switched call control functions. This allows data transfers over one or two B-channels provided by the ISDN network at a Basic Rate Access, using DECnet-VAX Phase IV, VAX P.S.I., and Specific protocols.

VAX ISDN ACCESS

SPD: 31.24
UPI: VZC

VAX ISDN ACCESS allows suitably configured DECnet-VAX nodes in a DECnet network to control connections to an ISDN network remotely at a DECnet node that is physically connected to the ISDN network running the VAX ISDN software. This type of node is called an ISDN connector node.

The ISDN connector node is a DECnet-VAX node that is physically connected to a supported ISDN network via a Basic Rate Access (DEC ISDNcontroller 100/DIV32) and is running both VAX ISDN software and DECnet-VAX software.

This node must be licensed for and running the VAX ISDN software. Refer to Software Product Description (SPD 31.23.) as well as DECnet-VAX, either end-node or full-function (SPD 25.03.).

VAX ISDN Primary Rate Access D Channel Interface for VMS

SPD: 33.53

VAX ISDN Primary Rate Access D Channel Interface for VMS provides Telephony applications a primary rate access (PRA) D-channel communications path to a Northern Telecom, Inc. SL-100 Automatic Call Distributor (ACD). It provides the ACD interface via a 64K bit DSV11 synchronous interface connected to the WAN driver kit. The applications interface is made via the product's LAPD (level 2) and a subset of Q.931/Q.932 protocols with a defined QIO interface.

VAX MAILGATE for MCI Mail

SPD: 27.34
UPI: 742

VAX MAILGATE for MCI Mail is a VMS electronic mail handling facility that communicates with the nationwide MCI Mail System to extend the reach and delivery options of the ALL-IN-1 based mail capability. VAX MAILGATE allows ALL-IN-1 users to add many of the capabilities of MCI Mail to their in-house mail system. Messages can be delivered to any address allowed by MCI Mail. Likewise, VAX MAILGATE allows ALL-IN-1 users to receive mail into their ALL-IN-1 mailbox from MCI Mail and Telex subscribers worldwide.

ALL-IN-1 users utilize addressing screens that are customized for use with MCI Mail to specify delivery and handling information for their messages. Online HELP is provided for these screens. Messages can be sent to VAX users, MCI Mail subscribers, users on other systems connected to MCI Mail, facsimile devices, and Telex users. In addition, printed copies of a message can be sent to anyone at a postal address using the sender's registered MCI letterhead and signature.

The system manager uses a utility called MGMAN to tailor VAX MAILGATE for small or large mail systems and to control daily operations. MGMAN allows the system manager to customize VAX MAILGATE by setting parameters in a configuration database for such things as MCI Mail access information, modem type, and the line to be used for connecting MCI Mail.

MCI Mail provides a service for the use of MICROCOM modems, which provides error correcting protocol for reliable communication. MCI Mail routes the messages to their ultimate destination. Incoming messages are transferred by VAX MAILGATE to the queue and posted to the VAX Message Router, which forwards them to the proper user agent and user as specified by the address.

VAX Message Router

SPD: 26.33
UPI: 732
730 (VMSmail gateway)
733 (Programmer kit)

VAX Message Router is a store- and forward-message transfer system that delivers messages within a DECnet Phase IV network. VAX Message Router supports messages with NBS- (National Bureau of Standards) constructed fields. Message construction conforms to the CCITT X.400 standard for message handling services. These messages consist of text, data, and arbitrary files. VAX Message Router logs message progress within the network and informs the sending application if messages are undeliverable.

Message Router requires application programs, called User Agents or Gateways, that format and display messages, interact with VAX Message Router to send and receive messages, convert received messages from VAX Message Router format into the required application format, and convert a sending application format into VAX Message Router format.

VAX Message Router is available in three packages. VAX Message Router Base provides message transport services required by Digital-supplied mail agents, directory, and management services. VMSmail Gateway consists of VAX Message Router Base and the Gateway to the VMS Personal Mail Utility. VAX Message Router Programmer's Kit consists of VAX Message Router Base and a run-time library of high-level interface routines. These routines may be built into user-written applications. The kit includes documentation to guide users in writing User Agents and Gateways.

VAX Message Router/P Gateway

SPD: 28.94
UPI: VCG

VAX Message Router/P Gateway is a network server, layered software product that resides on a VMS system. It provides an interconnection between MAILbus, and PROFS (Professional Office System) systems in a SNA network. Through VAX Message Router/P, users of Digital office automation systems can send and receive messages, documents, and binary files to and from users of IBM PROFS office systems. VAX Message Router/P allows notes to be exchanged with users of IBM's CMS systems.

VAX Message Router/P provides both address and content conversion for messages and documents passed between the Digital and IBM networks. VAX Message Router/P connects to an IBM host system, thus giving other PROFS nodes access to the Digital network through that IBM host. No Digital software has to be installed on the IBM system to accomplish the transfers. With some restrictions, VAX Message Router/P allows users to communicate through MAILbus to other networks, including public messaging services.

Message Router/P's DDS (Distributed Directory Service) function converts message addresses. Digital users who wish to send and receive mail to and from IBM users must be registered in DDS and assigned an alias or virtual address for the PROFS network. Message Router/P allows Digital and IBM users to be included in a single message address or distribution list. The software supports delivery confirmation and nondelivery notification messages.

Message Router/P concatenates Digital text messages with attached documents into a single document for transfer to the PROFS network. The software does not support messages with mixed contents. Message Router/P allows only one binary file to be passed to the IBM environment at a time; any attachments to these files are lost.

ALL-IN-1 automatically converts DECdx format to WPS-PLUS format. Other Digital user agents and MAILbus Gateways convert DECdx format to a format appropriate to their function. Since the capabilities of each vendor's word processing systems are not identical, and since some control information is not transmitted, Message Router/P does not convert all attributes and functions.

VAX Message Router/S Gateway

SPD: 29.24
UPI: VDU

VAX Message Router/S Gateway (MRS) is a network server layered software product that resides on VAX VMS systems providing interconnection between Digital's Message Router based electronic message systems and IBM Systems Network Architecture Distribution Services (SNADS). Through MRS, users of Digital office automation systems such as ALL-IN-1 can send and receive messages to and from users of IBM office systems.

VAX Message Router/S Gateway provides address and content conversion for messages and documents passed between the Digital and IBM office networks. Office users are not required to learn any new commands or procedures except the new addresses representing the users of the other network(s) with whom they can communicate by means of MRS. MRS connects to an IBM DISOSS system, which contains the host implementation of SNADS. Other SNADS nodes have access to the Digital network through that IBM host. No Digital software is required to be installed on the IBM system to accomplish these transfers. With some restrictions, MRS allows users of those IBM office systems to communicate through MAILbus to other networks including public messaging services.

A single MRS installation supports messaging services between a SNADS network of IBM office systems, a MAILbus network of Digital VMS systems, and any other messaging network connected to MAILbus. VAX Message Router is included in the distribution kit for MRS to provide MAILbus connections.

VAX Message Router Telex Gateway

SPD: 29.96
UPI: VAV

VAX Message Router Telex Gateway allows other Digital Message Router Gateways and user agents to exchange messages with the Public Telex Network.

The gateway provides a method for exchanging messages between the Digital mail domain and the Public Telex Network. The gateway uses third-party Telex hardware, the Hasler Telex, to communicate with the Telex network. The gateway interfaces with the Message Routers Transfer Service and drives the Hasler Telex, which communicates with the Public Telex Network.

The gateway provides a customizable formatter. Using the defined format, the gateway forwards incoming Telex messages to the user's electronic mail account without operator intervention.

VAX Message Router Telex Gateway transfers messages between the Telex environment and the MAILbus, interfaces to the Message Router's Distributed Directory Service, converts Digital document types to ITA2, supports character replacement with a string using VMS NCS routines, supports the interface to the Hasler Telex Unit, and provides a management interface for controlling, configuring, and maintaining the gateway.

Features include addressing, authorization, a formatter, a management function, prioritizing messages, configuring message length, generating delivery notifications, logging and journaling transaction events and internal state changes, and producing an accounting file.

VAX Message Router X.400 Gateway

SPD: 27.50
UPI: VDM

VAX Message Router X.400 Gateway is a layered VMS application that provides a communication path between a Message Router based network and another X.400 conforming Message Transport System. Together, Message Router X.400 Gateway and Message Router form an X.400 Message Transfer Agent.

The X.400 Gateway allows users of mail agents running on Message Router, for example, ALL-IN-1 to communicate with other X.400 mail systems either in other networks or within the same network. Some mail agents such as VMSmail (through the VMSmail Gateway) do not support the mandatory features of X.400.

Message Router supports messages constructed with fields defined by the National Bureau of Standards (NBS) Specification for the Message Format for Computer Based Message Systems. The structure of the messages supports the format specified in the CCITT X.400 standard for Message Handling Services. The Message Router X.400 Gateway converts the messaging protocols between NBS and X.400.

X.400 Gateway uses the Message Router user directory. This directory is used to address incoming mail and to authenticate senders of outgoing mail.

VAX Notes

SPD: 27.06
UPI: 960 (Server/client)
VES (Client only)

VAX Notes is a computer conferencing product that allows users to create and access online conferences or meetings. Computer conferencing lets users conduct meetings with people in different geographic locations. Participants can join in a discussion from their desks a time of their choice.

VAX Notes offers the feature of keeping a detailed record of the proceedings of a meeting, which can be searched by a variety of criteria, such as name of participant, subject, or keyword. It can also be used for an electronic bulletin board, collaborative document authoring and review, and internal classes or seminars.

VAX OSI Applications Kernel

SPD: 27.47
UPI: VD9

VAX OSI Applications Kernel (OSAK) offers the combined functions of VAX OSI Transport Service (VOTS) and VAX OSI Applications Kernel (OSAK) VOTS implemented the Open System Interconnection (OSI) Transport Layer and Internet Protocol. OSAK implemented the OSI Session Layer.

This product conforms to the Protocol Specifications produced by the International Organization for Standardization (ISO), and the International Telegraph and Telephone Consultative Committee (CCITT recommendations.

VAX Packetnet System Interface

SPD: 25.40
UPI: 071

VAX Packetnet System Interface (VAX P.S.I.) allows suitably configured VAX VMS systems to connect to packet switching data networks (PSDNs) conforming to CCITT recommendation X.25 (1978, 1980 or 1984) or to International Standards (ISO) 7776 and 8208. This software enables process-to-process and terminal communications between a VAX computer and remote data terminal equipment (DTE) in a PSDN supporting the ISO or X.25 interface protocols. VAX P.S.I. enables direct connection to equipment acting as data circuit terminating equipment (DCE) or DTE using the ISO protocols, or to any combination of PSDNs and equipment subject to the limitations noted below. The term DCE in this SPD refers to ISO point-to-point communications only; VAX P.S.I. does not provide any packet switching exchange facilities.

VAX P.S.I. allows a standard VAX VMS system configuration to function as a packet-mode DTE connected to a supported PSDN; a packet-mode DTE connected to a DCE conforming to International Standards 7776 and 8208; a packet-mode DCE connected to a DTE conforming to International Standards 7776 and 8208; or a combination of the above modes, chosen on a per line basis, except in the case of the KMS11-B multiline device, where all lines must use the same mode of operation and connect to the same PSDN.

VAX P.S.I. can be configured for either multihost or native mode operation. In native mode VAX P.S.I. supports connection to one or more PSDNs. In multihost mode VAX P.S.I. lets VAX P.S.I. Access systems use a PSDN as though directly connected.

VAX P.S.I., a layered product, can be used in process-to-process (X.25) communication, process-to-terminal (X.29) communication, terminal-to-process (X.29) communication, full DECnet communication, and open system interconnection. For these uses, VAX P.S.I. provides accounting information on P.S.I. usage, security, and the transfer of electronic mail using the VAX VMS mail facility.

VAX Packetnet System Interface Access

SPD: 27.78
UPI: 061

VAX Packetnet System Interface Access (VAX P.S.I. Access) allows a properly configured DECnet-VAX system in a DECnet environment to make logical connections to packet switching data networks (PSDNs) by way of one or more other connector nodes. With the connector node providing physical connection(s) to a PSDN(s), VAX P.S.I. Access enables process-to-process and terminal communications between the accessing VAX computer and remote data terminal equipment.

The connector node can be VAX P.S.I. (SPD 25.40) installed in multihost mode. The connector node can also be DECnet Router/X.25 Gateway (SPD 30.41). In this case, several features and options will not be available.

DECnet logical links are established by the VAX VMS system to connect the VAX P.S.I. Access host to the connector node. These links can use any supported DECnet communications path between the VAX P.S.I. Access node and the connector node, provided they do not themselves use an X.25 connection. VAX P.S.I. Access uses these links to transmit X.25 or X.29 messages between the connector node and the VAX P.S.I. Access host. However, successful use of an X.29 connection, either for incoming X.29 calls or by means of the host PAD utility supplied with VAX P.S.I. Access, depends on the DECnet circuit between the access and connector nodes having a low response time.

A single VAX P.S.I. Access host can logically connect to one or more connector nodes concurrently and therefore can access all PSDN(s) accessible from those connector nodes. By installing VAX P.S.I. Access, one of these combinations of several connector nodes or PSDNs is established as the default gateway to and from which all traffic would normally flow.

VAX Public Access Communications

SPD: 28.51
UPI: VFH

VAX Public Access Communications (VAXPAC) is a software product that provides the MicroVAX user with a mechanism for connecting the VMS operating system to a remote system using asynchronous lines. A remote system may be any system that accepts and displays data using an asynchronous interface compatible with EIA-232C, EIA-422, or EIA-423. The description that follows applies to MicroVAX II, MicroVAX 2000, and VAXstation 2000 systems running either the full MicroVMS operating system or the VMS operating system only.

All the features of VAX Public Access Communications are available using menus and forms. There is extensive online help to assist the user of VAX Public Access Communications.

VMS/SNA

SPD: 27.01
UPI: 362

VMS/SNA is a layered software product that allows suitably configured VMS systems to directly participate in an IBM Systems Network Architecture (SNA) networking environment. After installing the VMS/SNA software and one or more DECnet/SNA Access Routines, users can perform functions such as accessing IBM application programs or other system resources, act as a 3270 display station, exchange data files and documents with an IBM Host, and implement distributed application programs that run between the VMS and IBM systems.

Architecturally, a VAX system running VMS/SNA appears to the SNA network as a Physical Unit Type 2 node, and is attached to the SNA network through a synchronous communications device to an IBM 37 Communications Controller. The VMS/SNA software supports one synchronous communication line at speeds from 1.2K bps to 64K bps, depending on the communications device being used and a maximum of 16-64 concurrent SNA logical unit sessions depending on the VAX CPU it is running on. Both local and remote connections are supported from VMS/SNA into the IBM SNA network, using switched or leased lines in point-to-point or multipoint environments. VMS/SNA also supports connections over X.25 switched virtual circuits using Qualified Logical Link Control (QLLC). VAX Packetnet System Interface access is required for SNA over X.25 connections.

VMS/SNA can send Record Formatted Maintenance Statistics (RECFMS) messages to the IBM system. These messages contain counters requested by the IBM Netview Hardware Monitor using Request Maintenance Statistics (REQMS) messages. Not all RECFMS messages are supported by VMS/SNA.

Devices supported with VMS/SNA include the DST32, DSH32, DPV11, DSV11, DSF32, DMB32, and DSB32. All VAX P.S.I. supported devices for VAXBI and Q bus based systems are supported when communicating with X.25 networks using QLLC circuits. This excludes all UNIBUS devices, but does include the KMV1A.

VMS/ULTRIX Connection

SPD: 25.A4
UPI: VHR

VMS/ULTRIX Connection is a VMS layered software product that promotes interoperability and resource sharing between VMS systems and UNIX systems.

The VMS/ULTRIX Connection supports networking, file access, remote terminal access, and application development between VMS systems and UNIX systems. The VMS/ULTRIX Connection includes three major components: an ARPANET communication system; a network file system (NFS server); and a DEC remote procedure call (DECrpc) for VMS.

DEC Ada Preprocessor for ULTRIX/SQL

SPD: 33.14
UPI: YNR (VAX)
YNQ (RISC)

DEC Ada Preprocessor for ULTRIX/SQL is a full function SQL-based relational database management system designed for the ULTRIX Operating System. It is intended for general purpose, multiuser, centralized or distributed applications.

Embedded SQL is an embedding of the database language SQL into a procedural programming language.

The embedded SQL preprocessor converts the Embedded SQL statements in the application program into host language source code statements. These statements call a run-time library that provides the interface to ULTRIX/ SQL. The host language statements originally in the program are passed through the preprocessor without being altered. Once the program has been preprocessed, it can be compiled and linked in the usual fashion for the host language.

DEC C Preprocessor for ULTRIX/SQL

SPD: 33.10
UPI: YNV (VAX)
YNU (RISC)

DEC C Preprocessor for ULTRIX/SQL is a full function SQL-based relational database management system designed for the ULTRIX operating system. It is intended for general purpose, multiuser, centralized or distributed applications.

Embedded SQL is an embedding of the database language SQL into a procedural programming language.

The embedded SQL preprocessor converts the Embedded SQL statements in the application program into host language source code statements. These statements call a run-time library that provides the interface to ULTRIX/SQL. The host language statements originally in the program are passed through the preprocessor without being altered. Once the program has been preprocessed, it can be compiled and linked in the usual fashion for the host language.

DEC COBOL Preprocessor for ULTRIX/SQL

SPD: 36.82
UPI: XX1

DEC COBOL Preprocessor for ULTRIX/SQL is a full-function SQL-based relational database management system designed for the ULTRIX operating system. It is intended for general purpose, multi-user, centralized, or distributed applications.

Embedded SQL is an embedding of the database language SQL into a procedural programming language.

The Embedded SQL preprocessor converts the Embedded SQL statements in the application program into host language source code statements. These statements call a run-time library that provides the interface to ULTRIX/SQL. The host language statements originally in the program are passed through the preprocessor without being altered. Once the program has been preprocessed, it can be compiled and linked in the usual fashion for the host language.

Embedded SQL provides the applications with full access to ULTRIX/SQL databases. All statements that manipulate and manage data in interactive SQL are also available, generally unchanged, in the embedded version. Embedded SQL can provide applications with the ability to manipulate data structures, manipulate data, manage groups of statements as transactions, connect to multiple sessions, and perform other database management functions.

DEC FORTRAN for OSF/1

SPD: 37.54
UPI: MD3

DEC FORTRAN for OSF/1 is an implementation of full language FORTRAN-77 conforming to American National Standard FORTRAN, ANSI X3.9-1978. It includes optional support for programs conforming to the previous standard, ANSI X3.9-1966. DEC FORTRAN meets the Federal Information Processing Standard Publication (FIPS-69-1) requirements by conforming to the ANSI Standard and by including a flagger. The flagger optionally produces diagnostic messages for compile-time elements that do not conform to the Full-Level ANSI FORTRAN X3.9-1978 Standard. DEC FORTRAN also conforms to the International Standard ISO 1539-1980(E) and conforms to MIL-STD 1753.

DEC FORTRAN supports extensions to the ANSI standard including a number of extensions defined by the VAX FORTRAN compiler that runs on VMS and ULTRIX systems.

DEC FORTRAN for ULTRIX RISC Systems

SPD: 33.05
UPI: VV6

DEC FORTRAN for ULTRIX RISC Systems is an implementation of full language FORTRAN-77 conforming to American National Standard FORTRAN, ANSI X3.9-1978, although it is not currently validated. It includes optional support for programs conforming to the previous standard, ANSI X3.9-1966. DEC FORTRAN meets the Federal Information Processing Standard Publication (FIPS-69-1) requirements by conforming to the ANSI Standard and by including a flagger. The flagger optionally produces diagnostic messages for compile-time elements that do not conform to the Full-Level ANSI FORTRAN X3.9-1978 Standard. DEC FORTRAN also conforms to the International Standard ISO 1539-1980 (E) and conforms to MIL-STD 1753.

DEC FORTRAN supports extensions to the ANSI standard including a number of extensions defined by the VAX FORTRAN compiler that runs on VMS and ULTRIX systems.

DEC FORTRAN Preprocessor for ULTRIX/SQL

SPD: 33.12
UPI: YNT (VAX)
YNS (RISC)

DEC FORTRAN Preprocessor for ULTRIX/SQL is a full function SQL-based relational database management system designed for the ULTRIX operating system. It is intended for general purpose, multiuser, centralized or distributed applications.

DEC FORTRAN, the procedural programming language. contains an Embedded SQL.

The embedded SQL preprocessor converts the Embedded SQL statements in the application program into host language source code statements. These statements call a run-time library that provides the interface to ULTRIX/SQL. The host language statements originally in the program are passed through the preprocessor without being altered. Once the program has been preprocessed, it can be compiled and linked in the usual fashion for the host language.

DEC InfoServer Client for VMS

SPD: 33.91
UPI: GGW
YTC (InfoServer access license)

DEC InfoServer Client for VMS enables VAX systems running VMS Operating System to access the InfoServer 100 Ethernet-based virtual disk server.

The InfoServer 100 is an Ethernet-based, high performance virtual disk server. Physical disk media and sets of logical disk blocks can be served to the network by the InfoServer. Host systems running the appropriate client software can connect to the virtual disks served by the InfoServer 100, and use them as though they were locally attached devices.

DEC InfoServer Client for VMS is used by client systems to install or upgrade software using the InfoServer 100-based media, access on-line documentation via Bookreader with the InfoServer 100 as its data source, or access any other CDROM-based data with a disk format supported by VMS.

Although the InfoServer 100 supports read-write access, this kit is restricted to providing read-only support to the InfoServer 100.

DEC RALLY for VMS

SPD: 27.03
UPI: A86 (Development)
VF4 (Runtime)

DEC RALLY for VMS provides a powerful fourth-generation environment for developing interactive database applications. As an integrated package, RALLY provides tools to define Rdb/VMS databases, forms, reports, menus, and on line help for the application user.

Application developers can use RALLY's menu interface and extensive defaulting capabilities to create simple applications quickly. More sophisticated applications can be created in the RALLY editing environment.

DEC RdbAccess for ORACLE on VMS

SPD: 32.80
UPI: YQV

DEC RdbAccess for ORACLE on VMS is a family of database interoperability products which provide direct, transparent access from VAX Rdb/VMS applications to non-VAX Rdb/VMS databases and files. DEC RdbAccess servers are specialized VAX Rdb/VMS run-time systems which can be accessed by most applications and tools which work with VAX Rdb/VMS. DEC RdbAccess for ORACLE on VMS (referred to as RdbAccess for ORACLE) provides direct, transparent, read-only access to ORACLE databases residing on VAX/VMS systems from applications developed using products such as VAX RALLY, VAX DATATRIEVE, VAX TEAMDATA, and DECdecision.

RdbAccess for ORACLE also supports access from the VAX Rdb/VMS interactive utilities, SQL and RDO, from precompiled 3GL applications with embedded SQL or RDML, and from desktop applications using SQL/Services. VAX Data Distributor can be used to extract data from ORACLE and replicate the information across the network in VAX Rdb/VMS.

RdbAccess for ORACLE runs under VMS on VAX, MicroVAX, VAXserver, and VAXstation systems.

DEC RdbAccess for VAX RMS on VMS

SPD: 32.88
UPI: YQZ

DEC RdbAccess for VAX RMS on VMS (RdbAccess for VAX RMS) is a member of the DEC RdbAccess family of database interoperability products. It permits transparent, read-only access to VAX RMS files via the VAX implementation of the Structured Query Language (VAX Rdb/VMS SQL). It also permits SQL read-only access to data sets on IBM MVS systems via the DECnet/SNA Data Transfer Facility (DTF). RdbAccess for VAX RMS retrieves the data definitions for the information contained in these files from VAX CDD/Plus. RdbAccess for VAX RMS emulates a relational database, and enables SQL access by combining the source data

RdbAccess for VAX RMS can be used in conjunction with products such as VAX TEAMDATA, DECdecision, and Rdb/VMS utilities including interactive SQL. It can also be used in conjunction with VAX Data Distributor and VAX Rdb/VMS SQL/Services as well as 3GL applications with embedded SQL.

DEC RdbExpert for VMS

SPD: 31.72
UPI: VFJ

DEC RdbExpert for VMS is a DECwindows and command-line-based expert system database tuning tool that is designed to reduce the time and effort required to produce tuned VAX Rdb/VMS physical database storage designs. DEC RdbExpert is intended to help database designers and administrators during the initial design and subsequent maintenance phases of database development. DEC RdbExpert should expand the tuning capabilities of less experienced database administrators while improving overall DBA tuning productivity.

DEC RdbExpert gathers information of importance encompassing logical level input related to physical design. DEC RdbExpert bases its design recommendations on this logical schema information, as well as the system environment, database record volumes, and transaction workload information. DEC RdbExpert makes extensive use of import functions which enables users to quickly provide the required data. For example, DEC RdbExpert can import DECtrace transaction workload data captured directly from running VAX Rdb/VMS databases for use in the design process, thus creating designs based upon the actual workload executing against existing databases. The DBA then reviews this input and modifies it where necessary to ensure that it is an accurate reflection of the actual run time requirements.

DEC RdbExpert generates storage designs in the form of the SQL Data Definition Language statements for VAX Rdb/VMS. It also generates executable storage design creation procedures as well as the VAX Rdb/VMS RMU/LOAD and UNLOAD scripts used to unload existing data and reload it into the redesigned database. In addition, DEC RdbExpert generates design reports to educate the DBA about the design process and the database tuning rules.

The DEC RdbExpert knowledge base is cognizant of the VAX Rdb/VMS database system internals, tuning rules, and run-time optimizer heuristics. DEC RdbExpert uses this knowledge to help the DBA arrive at the performance tuned design.

DEC VTX

SPD: 26.57
UPI: 031

DEC VTX is a distributed information retrieval service that utilizes a tree structured database through which the user navigates by selecting choices from a menu. The content of the videotex infobase consists of full screen pages of information supplied by the Information Providers.

The information contained in the infobase is prepared with standard Digital editors (WPS-PLUS, TPU, EDT, DECgraph, DECslide, DECwrite, etc.) to create the pages of information.

DECforms

SPD: 29.90
UPI: VCH (VMS full development)
VNS (VMS runtime)
GVR (RISC ULTRIX full development)
GVS (RISC ULTRIX runtime)

DECforms offers application developers a set of software development tools and a run-time environment for implementing powerful, yet user friendly, human interfaces. DECforms supports the full range of VT100, VT200, VT300 and VT420 series terminals and compatible terminal emulators on PCs and workstations. DECforms also supports the development and display of Hebrew forms (right to left text path) on Hebrew VT100, VT200, and VT300 series terminals.

DECforms offers a robust combination of the capabilities of previous Digital Equipment Corporation forms systems, such as VAX FMS and VAX TDMS. In addition, DECforms offers a number of significant features not previously available in a Digital forms product.

DECforms integrates with VAX ACMS and DECintact to provide powerful forms processing capabilities in transaction processing environments. A private, asynchronous call interface to VAX ACMS and DECintact allows a single DECforms run-time process to control multiple terminals simultaneously in a multi-threaded fashion, resulting in efficient use of memory. Using the VAX ACMS Remote Access Option or DECintact Remote Access Option, DECforms can be distributed to remote CPUs, thus off loading forms processing from the host CPU and distributing it as close to the end user as possible.

DECforms is Digital's VMS implementation of the proposed ANSI/ISO standard for a Form Interface Management System (FIMS). The Form Interface Management System is an industry software system and is not the property of any company or group of companies, or of any organization or group of organizations. DECforms offers a subset of the full functionality described by the CODASYL FIMS Journal of Development, with extensions tailored for the VMS environment.

DECintact

SPD: 29.58
UPI: VF1 (Development)
VF2 (Runtime)
VF3 (Remote access)

DECintact (Integrated Application Control System) product provides a foundation for building simple and complex transaction processing applications on one or more VAX systems under the VMS operating system. The DECintact product runs as a collection of services and several processes under the VMS operating system. It supports either single threaded (Per-Process) or multi-threaded (Server) application program design methodologies. Multiple versions of the DECintact product may execute at the same time, sharing physical memory, and be completely independent.

DECnet/SNA VMS Data Transfer Facility

SPD: 27.85
UPI: VEB (Server)
VEK (Utilities)
1GQ (MVS)
GUY (VM)

DECnet/SNA VMS Data Transfer Facility (DTF) is a layered software product that provides data transfer capabilities between IBM MVS and IBM VM systems in a Systems Network Architecture (SNA) environment and Digital DECnet nodes in a DECnet network. DTF supports the following DECnet nodes: VMS systems running DECnet-VAX, RSX-11M-PLUS systems running DECnet-11M-PLUS, ULTRIX systems running DECnet-ULTRIX, MS-DOS systems running PATHWORKS for DOS, and OS/2 systems running PATHWORKS for OS/2. Access between the cooperating Digital and IBM environments is provided by a DECnet/SNA Gateway or by VMS/SNA software.

DECnet/SNA Gateway for Channel Transport

SPD: 29.76
UPI: VC9

DECnet/SNA Gateway for Channel Transport is a member of the DECnet/SNA Transport product family. This family consists of hardware and software products that allow users to exchange information and share resources between suitably configured Digital systems in a DECnet environment and IBM systems in a Systems Network Architecture (SNA) environment. Users on one or more Digital systems can simultaneously perform functions such as accessing IBM application programs or other system resources, act as a 3270 display station, perform data transfer between Digital and IBM file systems, exchange electronic documents and mail messages, submit jobs to IBM batch subsystems acting as a Remote Job Entry workstation, and implement distributed, task-to-task application programs that run between Digital and IBM systems.

The DECnet/SNA Transport product set provides a means of connecting DECnet and SNA networks which can be used by a wide variety of Digital supplied access routines running under VMS, MS-DOS, and ULTRIX operating environments. The DECnet/SNA Gateway-CT is managed and configured using the DECnet/SNA management software that is part of the DECnet/SNA Gateway-CT product.

DECnet/SNA Gateway for Synchronous Transport

SPD: 25.C6
UPI: S01

DECnet/SNA Gateway for Synchronous Transport (DECnet/SNA Gateway-ST) is a member of the DECnet/SNA Gateway product family. This family consists of hardware and software products that allow users to exchange information and share resources bi-directionally between suitably configured Digital systems in a DECnet environment and IBM systems in a Systems Network Architecture (SNA) environment.

Users on one or more Digital systems can simultaneously perform functions such as accessing IBM application programs or other system resources, act as a 3270 display station, perform data transfer between Digital and IBM file systems, exchange electronic documents and mail messages, submit jobs to IBM batch subsystems acting as a Remote Job Entry work-station, and implement distributed, task-to-task application programs that run between Digital and IBM systems.

(Continued)

DECnet/SNA Gateway for Synchronous Transport *(Continued)*

The DECnet/SNA product set provides a system connecting DECnet and SNA networks which can be used by a wide variety of Digital-supplied access routines running under VMS, MS-DOS, and ULTRIX operating environments. DECnet/SNA Gateway-ST is managed and configured using the gateway management software that is part of DECnet/SNA Gateway-ST.

DECnet/SNA ULTRIX 3270 Data Stream

SPD: 30.64
UPI: XD2 (VAX)
XD9 (RISC)

DECnet/SNA ULTRIX 3270 Data Stream Programming Interface (ULTRIX 3270 DSPI) is a layered software product designed for use by programmers using a VAX ULTRIX or RISC ULTRIX system in a DECnet network environment. The product enables these programmers to create ULTRIX system applications that communicate with IBM applications that use IBM's LU type 2 (LU2) protocol on an IBM host. Communication between cooperating Digital and IBM applications is facilitated by one of Digital's DECnet/SNA Gateway products.

Programmers can use the ULTRIX 3270 DSPI to create a wide range of applications. For instance, in a case where customer information resides on an IBM system, and product information resides on a VAX ULTRIX or RISC ULTRIX system, the product can be used to develop an application that integrates all of this information.

DECnet/SNA ULTRIX 3270 Terminal Emulator

SPD: 29.88
UPI: 022

DECnet/SNA ULTRIX 3270 Terminal Emulator is a layered software product that allows users of a VT (or other Digital terminal, workstation, or personal computer in VT emulation mode) on suitably configured ULTRIX systems in a DECnet environment to access IBM mainframe applications interactively. The applications, originally developed for use with IBM 3270 display stations in a Systems Network Architecture (SNA) networking environment, can be accessed through the DECnet/SNA Gateway.

In normal operation, an IBM application transfers a formatted screen, much like a form or panel, to the 3270 display. The user then fills in any data the form requires. When complete, the form is transmitted to the IBM host system as a single unit. This mechanism is emulated on a Digital terminal by buffering the form in the DECnet host's memory and displaying it on the terminal. When the form is complete, it is sent to the IBM system through the DECnet/SNA Gateway.

Translation tables on the ULTRIX system convert ASCII terminal input to a subset of IBM multinational EBCDIC code for transfer through the DECnet/SNA Gateway. These tables can be modified to fit nonstandard character sets.

Users invoke the ULTRIX 3270 terminal emulator from the ULTRIX shell. A predefined set of commands used to invoke the emulator includes qualifiers specifying the IBM system and system resources with which the user wishes to connect. While the emulator is operating, the terminal screen is formatted like the IBM 3270 display. At initial installation, keyboard mapping adheres to a set of defaults. The user can, at any time, re-map the keyboard to suit a particular application environment. The user can then store the customized keyboard mapping information for later use. Online HELP provides information about the current keyboard layout and functions.

DECnet/SNA VMS 3270 Data Stream Programming Interface

SPD: 26.87
UPI: 363

DECnet/SNA VMS 3270 Data Stream Programming Interface lets user-written applications running on suitably configured VMS systems within a DECnet network or VMS/SNA environment exchange messages with cooperating applications in an IBM host. Access between applications is through DECnet/SNA Gateway or VMS/SNA software.

This product is a set of subroutines designed to provide an interface for the application programmer who has a specific need to interface to an IBM application subsystem. These subroutines perform functions such as establishing sessions, sending data, receiving data, and disconnecting sessions. The interface can also be used to interpret the 3270 data stream and build a screen image.

DECnet/SNA VMS 3270 Data Stream Programming Interface allows two modes of connection, the Data Stream Mode and the Field Mode.

DECnet/SNA VMS 3270 Terminal Emulator

SPD: 26.84
UPI: 454

DECnet/SNA VMS 3270 Terminal Emulator is a layered product that lets users of VTxxx terminals, other Digital terminals, or PCs in VT100, VT200, or VT300 emulation mode interactively access IBM host-based applications. These applications were originally developed for IBM 3270 display stations in a Systems Network Architecture (SNA) networking environment. Access to the IBM networking host-based applications systems from VMS systems is through the DECnet/SNA Gateway or through VMS/SNA.

Translation tables on the respective systems convert ASCII terminal input to a subset of IBM multinational EBCDIC code for transfer through either the DECnet/SNA Gateway or VMS/SNA software. These translation tables can be modified to fit nonstandard character sets.

Users invoke the 3270 utility using the local VMS system's command language. While the emulation utility is operating, the terminal screen will be formatted in a fashion similar to an IBM 3270 display. When the user has finished work on the IBM system, the 3270 emulator is dismissed, and the terminal is "restored" as a VMS command terminal.

An online HELP facility provides information on keys with altered 3270-oriented functions. DECnet/SNA VMS 3270 Terminal Emulator does not support the status line as implemented on an actual 3270 display; however, much of the same information is reported on a special status line that can be overlaid on the 24th line of the VT200. VMS system managers have the ability to remap certain IBM key functions onto different locations on the Digital keyboard.

DECnet/SNA VMS APPC/LU6.2 Programming Interface

SPD: 26.88
UPI: 022

DECnet/SNA VMS APPC/LU6.2 Programming Interface (APPC) is a layered software product that allows user-written applications running on suitably configured VMS systems either within a DECnet network or running VMS/SNA software to exchange messages with cooperating applications in an IBM host. The APPC software exists in the VMS system as a shareable image. Access between the cooperating Digital and IBM applications is via the DECnet/SNA Gateway or VMS/SNA software.

DECnet/SNA VMS Application Programming Interface

SPD: 26.86
UPI: 455

DECnet/SNA VMS Application Programming Interface is a layered software product that lets user-written applications, running on suitably configured VMS or MicroVMS systems within a DECnet network or on suitably configured MicroVMS systems within a VMS/SNA environment, exchange information with cooperating IBM host applications. Access between the applications is through DECnet/SNA Gateway or VMS/SNA software.

This application programming interface consists of a set of subroutines that provides an interface for VMS application programmers who have a specific need to interface to an IBM application subsystem. Functionally, the interface is similar to the DECnet task-to-task capability in that it is general and lets most features of the SNA session layer be accessed by the cooperating applications.

This facility is useful for applications that require facilities other than DECnet/SNA VMS Remote Job Entry and DECnet/SNA VMS 3270 Terminal Emulation.

DECnet/SNA VMS DISOSS Document Exchange Facility

SPD: 26.72
UPI: 042

DECnet/SNA VMS DISOSS Document Exchange Facility (DDXF) is a VMS-layered software product that allows its users the bidirectional ability to participate in an IBM office systems network. The IBM office network is the vehicle for document library and distribution services in an IBM Systems Network Architecture (SNA) networking environment. Access from the VMS system to the IBM/SNA network is through a DECnet/SNA Gateway or VMS/SNA software.

DDXF users can file a document created on the VMS system with associated profile information in a DISOSS/370 host document library; file profile information for an external (nonsystem) document in the DISOSS/370 host document library; search a DISOSS/370 host document library for documents previously filed by themselves or by other DISOSS/370 users, including users of IBM office systems; retrieve documents and associated profile information to the VMS or MicroVMS system from the DISOSS/370 host document library; and delete ownership of documents filed in the DISOSS/370 host document library.

DDXF users can also add search terms and modify access codes for documents filed in the DISOSS/370 host document library; print a document, filed in the DISOSS/370 host document library, on a DISOSS/370 host-controlled printer; send documents and messages to either individuals or groups that are DISOSS/370 users using the DECnet/SNA Gateway and the DISOSS/370 host; receive documents and messages distributed by other DISOSS/370 users through the DISOSS/370 host system; and display status information regarding distribution requests made by DDXF to the DISOSS/370 host system.

DECnet/SNA VMS Distributed Host Command Facility

SPD: 26.71
UPI: 043

DECnet/SNA VMS Distributed Host Command Facility is a VMS layered product used in conjunction with DECnet/SNA Gateway products. It allows IBM host-controlled 327x display stations in a SNA environment to access suitably configured VMS systems in a DECnet network.

The software allows VMS systems to communicate with IBM HCF (Host Command Facility) products which access, monitor, and control remote IBM system computers. The software provides IBM users with line mode or glass TTY access to the VMS system. The software is not a general-purpose, full-screen access mechanism to the VMS system.

DECnet/SNA VMS Distributed Host Command Facility features access to VMS applications specifically designed to run with 327x terminals, full-screen mode sessions from NetView, 8-bit code support, and error messages.

The software allows VMS system managers to modify the EBCDIC-to-DMCS translation tables and AID key mappings. It allows the DECnet/SNA gateway manager to create the Distributed Host Command Facility configuration and modify the initial connect screen.

DECnet/SNA VMS Printer Emulator

SPD: 26.70
UPI: 044

DECnet/SNA VMS Printer Emulator allows suitably configured VMS systems in a DECnet network or running VMS/SNA software to receive printable data from IBM host-based applications. These applications were originally developed to produce output for an IBM 3287 printer in system mode that is connected to an IBM 3274 cluster controller in a Systems Network Architecture (SNA) networking environment. Access from the IBM system to VAX VMS systems is through a DECnet/SNA gateway or VMS/SNA software.

This software allows VMS users to direct the received output to be printed through the VMS print symbiont or spooled to a disk file. This software is configured and controlled through a Digital Command Language style interface and can accept data in SNA Character String (SCS) format (LU Type 1) and 3270 Data Stream format (LU Type 3).

DECnet/SNA VMS Remote Job Entry

SPD: 26.85
UPI: 453

DECnet/SNA VMS Remote Job Entry (RJE) lets suitably configured VMS systems within a DECnet network function as SNA/RJE workstations that can transmit batch jobs to an IBM host and receive job output. With the required privilege, VMS users can issue restricted commands to manage the workstation. All users have the option of specifying servers. Access to the IBM SNA host environment is through DECnet/SNA Gateway or VMS/SNA software.

Each workstation includes a console interface that an operator can use to communicate with the job entry system in the IBM host. RJE can support record sizes of up to 245 characters and supports data compression on reader streams and on printer and punch streams.

DECquery for Macintosh

SPD: 34.12
UPI: GGC

DECquery for Macintosh is an interactive database query tool for Apple Macintosh computer users. It provides a graphical interface that allows users to formulate queries and send them to a relational database to retrieve specific data.

DECquery for Macintosh gives users direct online access to remote server databases (such as Rdb, DB2, VSAM, ORACLE, and so on). Users can access relational data from any Digiital Database Architecture compliant database and extract needed data for use in various desktop applications.

DECquery for ULTRIX

SPD: 36.78
UPI: MD2

DECquery for ULTRIX is an interactive database query tool for RISC DECstation computer users. It provides an OSF/Motif-compliant graphical interface that enables end-users to formulate queries and send them to a relational database to retrieve specific data.

DECquery for ULTRIX provides end-users with direct online access to local and remote server databases (such as ULTRIX/SQL, Rdb/VMS, IBM DB2, Oracle, and so on). Users can access any Digital Database Architecture-compliant data source and extract needed data for use in other workstation applications.

DECquery for VMS

SPD: 36.77
UPI: MD1

DECquery for VMS is an interactive database query tool for VAXstation computer users. It provides an OSF/Motif-compliant graphical interface that enables end-users to formulate queries and send them to a relational database to retrieve specific data.

DECquery for VMS provides end-users with direct online access to local and remote server databases (such as Rdb/VMS, ULTRIX/SQL, IBM DB2, Oracle, etc. Users can access any Digital Database Architecture compliant data source and extract needed data for use in other workstation applications.

DSM DDP-DOS

SPD: 50.19
UPI: YG7

DSM DDP-DOS is a software product which allows selected personal computers to access DSM databases on VAX DSM and DSM-11 systems within a local area network.

DDP (Distributed Data Processing) is a communications protocol used by all DSM products to access VAX DSM and DSM-11 databases across a local area network. DSM products share MUMPS databases by exchanging DDP messages in an Ethernet-based local area network.

The DSM DDP-DOS program services MUMPS database requests on behalf of other DOS programs. DDP-DOS (the client, running on the personal computer) formats the requests and transmits them to a DSM node (the server) through the local area network. The serving system, which can either be a VAX DSM or DSM-11 system, replies with the requested data. When the client receives the response, DDP-DOS interprets the incoming message and delivers the data to the DOS program that made the request.

DSM for ULTRIX

SPD: 33.76
UPI: GFF

DSM for ULTRIX (Digital Standard MUMPS) is an implementation of the ANSI Standard Specification for MUMPS (X11.1-1990) that is layered on the ULTRIX operating system. It is a high level interpretive programming language and a multiuser data management system in which many users can share a common database. DSM for ULTRIX software supports a superset of the ANSI MUMPS specification, fully uses the capabilities of the ULTRIX operating system, and is for use on Digital's RISC DECsystems and DECstations.

The DSM for ULTRIX utility set includes the DSM Application Software Library (DASL) software. The DASL software is an application creation tool which combines a Data Dictionary, Screen (form) Compiler, Report Compiler, and an end user SQL compliant Query Driver. DASL software uses code generation techniques to transform DASL commands and SQL statements into efficient MUMPS code. DSM for ULTRIX also includes an interface to DECwindows, which allows the application programmer to create sophisticated graphical user interfaces.

The DSM for ULTRIX language couples the flexible processing of variable length string data with a high-performance database system, making interactive database application systems easier to implement and maintain.

EDCS II

SPD: 26.39
UPI: 518

EDCS II is an integration tool that provides tracking, access control, change notification and archiving of data across a network regardless of the application that was used to generate the data. EDCS II manages important information about the documents it is controlling. In addition, EDCS II manages nonelectronic data such as design drawings stored on microfilm or hardcopy. It provides revision tracking of work in process, work in review and released documents. EDCS II provides an automatic notification capability that maintains lists of persons affected by changes and informs them of the current status.

EDCS II is a management tool that enables users to efficiently share data. It frees users from concerns over the existence of multiple originals, latest revisions, and change notification issues. EDCS II uses a Client/Server Architecture where the client provides the user interface and connects to the server which performs all data management tasks.

EDCS II supports several interfaces for integration. For the end-user, EDCS II comes with both a terminal and DECwindows interface providing a common menu system for both character cell terminals and workstations. For system integrators, EDCS II has a complete callable interface providing a mechanism to integrate EDCS II into any application suite.

FORTRAN IV/VAX to RSX, PDP-11 Cross Compiler

SPD: 25.17
UPI: 107

FORTRAN IV/VAX to RSX, PDP-11 Cross Compiler is an extended FORTRAN implementation based on the former American National Standards Institute (ANSI) FORTRAN, X3.9-1966. The compiler operates under the VAX-11 RSX-layered product on VMS systems. Programs compiled and tasks built can be transported to remote RSX-11M, RSX-11M PLUS, or RSX-11S systems or executed on the VMS system under VAX-11 RSX.

The FORTRAN IV language extensions to the 1966 ANSI standard include general expressions allowed in all meaningful contexts; mixed-mode arithmetic; BYTE data type for character manipulation; ENCODE, DECODE, and PROGRAM statements; PRINT, TYPE, and ACCEPT input/output statements; direct access, unformatted, input/output DEFINE FILE statement; comments allowed at the end of each source line; OPEN and CLOSE file access control statements; and list-directed input/output.

Additionally, virtual arrays are supported on target systems with memory management directives. Virtual arrays are memory-resident and require enough main memory to contain all elements of all arrays.

PDP-11 DATATRIEVE/VAX

SPD: 25.14
UPI: 105

PDP-11 DATATRIEVE/VAX is an interactive query, report, and data maintenance system. It utilizes RMS to access data contained in disk files of sequential, indexed, or relative organization. DATATRIEVE/VAX provides facilities for selective data retrieval, sorting, formatting, updating, and report generation, without the need for programming. DATATRIEVE/VAX enables users to define domains that cross RMS file definitions and subset record definitions.

DATATRIEVE/VAX stores record and domain definitions in shared data dictionaries. Data dictionaries also store frequently used command sequences for recall and later processing. Commands let users list data dictionary contents, delete entries, and control access to individual entries. A dictionary compression utility compresses the data dictionary index file.

DATATRIEVE/VAX provides an ADT (Application Design Tool) that assists novice users in creating domain and record definitions. ADT uses an interactive dialogue technique to guide users through the data definition process. It creates an indirect command file that updates the DATATRIEVE/VAX data dictionary.

A report writer provides commands to control report name, date, and page numbering; page width and length; detail line; multiple control break with automatic totaling; and multiple report sections. DATATRIEVE/VAX report commands intermix with other DATATRIEVE/VAX commands.

DATATRIEVE/VAX uses English-like commands for retrieving, modifying, and displaying data. Prompting is automatic for command and data entry. Major commands include HELP, READY, FIND, SORT, PRINT, SELECT, MODIFY, STORE, ERASE, FOR, EDIT, DROP, DECLARE, DEFINE, and REDEFINE.

In addition to simple data manipulation commands, more complex commands include REPEAT, BEGIN-END, and IF-THEN-ELSE. These can be used to create single compound commands that can be stored in the data dictionary as procedures for invocation by less experienced users.

DATATRIEVE/VAX arithmetic operators include addition, subtraction, multiplication, division, and negation. Statistical operators include total, average, maximum, minimum, and count. Data types include those used in FORTRAN, COBOL, DIBOL, and BASIC-PLUS-2.

DATATRIEVE/VAX provides data encoding, decoding, and input validation through tables stored in the data dictionary. Users can also check data validity by storing validation criteria in the record definition.

PDP-11 FORTRAN-77/VAX to RSX

SPD: 26.16
UPI: 138

PDP-11 FORTRAN-77/VAX to RSX is a compatibility mode compiler. Source programs can be compiled under VAX-11 RSX and the object modules then transported to an RSX system for task building and execution.

The package is an extended implementation of the ANSI subset FORTRAN-77 standard (X3.9-1978). It contains all the features of the ANSI FORTRAN-77 subset, many of the full set language features, and extensions that are not included in the ANSI FORTRAN-77 standard. Switch-selectable support is provided for programs based on the previous ANSI FORTRAN standard (X3.9 1966).

PDP-11 FORTRAN-77/VAX to RSX meets the Federal Information Processing Standard Publication (FIPS PUB-69) requirement for ANSI compliance and for a flagger. The flagger optionally produces diagnostic messages for syntax and/or source form elements that do not conform to the full-level ANSI FORTRAN X3.9-1978 standard.

Programs can be optionally executed under control of PDP-11 FORTRAN-77 Symbolic Debugger/VAX to RSX, which helps locate programming errors in successfully compiled programs that behave abnormally when executed.

ULTRIX Disk Shadowing

SPD: 34.27
UPI: GZM (VAX)
GMP (RISC)

ULTRIX Disk Shadowing software provides high data availabiity by protecting against loss of data from media deterioration, communication path failure, or controller or device failure. ULTRIX Disk Shadowing software provides high data availability by maintaining multiple copies of the same data on two or up to a maximum of three disks. The software consists of a device driver and a set of utilities. The device driver part of the software provides logical disk abstraction to higher level software. The utilities facilitate management of the shadow devices.

Once a shadow device is created, a file system may be structured and mounted on it. The disk shadow driver allows the root file system as well as other file systems to be structured on a shadow device. Alternatively, the shadow device can be accessed directly through its raw interface,

The utilities allow easy management of shadow devices. For example, a disk may be added as a member of a shadow device, while the shadow device is being actively accessed by other applications. Shadow devices may be created and destroyed without requiring a system reboot. Following an orderly shut-down or a system crash, the shadow devices can be returned to a consistent state.

ULTRIX/SQL Remote Access to Rdb/VMS

SPD: 34.89
UPI: YNP

ULTRIX/SQL Remote Access to Rdb/VMS allows users to access Rdb/VMS data remotely from ULTRIX/SQL.

ULTRIX/SQL is a full-function SQL-based relational database management system designed for the ULTRIX operating system. It is intended for general purpose, multi-user, centralized, or distributed applications.

ULTRIX/SQL Remote Access connects ULTRIX/SQL to the Rdb/VMS relational database management system, which manages and accesses its own files. The main function of ULTRIX/SQL Remote Access is to translate OpenSQL queries into a form understood by the Rdb database.

OpenSQL is a set of Structured Query Language statements and syntax that is portable across ULTRIX/SQL and Rdb/VMS. ULTRIX/SQL Remote Access translates ULTRIX OpenSQL into dynamic VAX SQL.

VAX ACMS (Application Control and Management System)

SPD: 25.50
UPI: 079 (Development)
076 (Runtime)
Y30 (Remote access)

VAX ACMS (Application Control and Management System) is a transaction processing (TP) monitor that works with other Digital commercial applications to provide complete customizable development and run-time environments for transaction processing applications. These applications include order tracking, accounting and billing, shop floor control, insurance claims, and funds transfer.

VAX ACMS helps users design, develop, implement, manage, and maintain complex TP applications. It also provides a special purpose applications definition language for structured definition of TP application functionality and run-time characteristics.

VAX ACMS provides integration with many Digital layered products, including DECforms, VAX TDMS, VAX CDD/Plus, VAX DBMS, and more. It is also capable of operating with an open front end and back end, allowing utilization of nonstandard terminal or I/O devices and any manner of data management or communications link.

System features include: a run-time system; seven utilities for application management and control; a forms manager for forms processing; database management; a data dictionary; queuing; security; a VAXcluster environment and availability; optional Run-Time or Remote Access Option; and documentation.

VAX CDD/Plus

SPD: 25.53
UPI: 897

VAX CDD/Plus is an active, distributed data dictionary system that provides a single logical repository for data definitions (metadata) and descriptions shared by VAX languages, tools and information management products.

VAX CDD/Plus provides a way to define and track metadata that is to be used by more than one product and provides a mechanism for sharing, relating and reporting on the dictionary contents.

The metadata in CDD/Plus keeps track of location, type, format, size, change history, and usage of the actual data (which is stored and maintained outside the data dictionary). All changes to the metadata are controlled by the dictionary. This can provide better control of the application development and dictionary administration processes.

VAX Data Distributor

SPD: 27.76
UPI: VDR

VAX Data Distributor manages the automated distribution of relational data among multiple processors in a distributed database environment. From a source (master) relational database, VAX Data Distributor can create one or more copies or subsets (target Rdb/VMS databases) on the same processor or remote processors. In addition, VAX Data Distributor can collect data from several source databases and create an Rdb/VMS target database that contains a rollup of that data.

VAX Data Distributor works with database management products which conform to the Digital Standard Relational Interface (DSRI) products such as VAX Rdb/VMS and VIDA for DB2. DSRI is an architecture for relational database management systems as well as a standard calling mechanism that can be used for database creation, population, and query.

VAX Data Distributor provides the user with three methods of distributing data from source databases; extraction, extraction rollup, and replication. All methods allow a defined subset of a source database to be created at a user specified location. Data can be transferred to the target VAX Rdb/VMS database on demand, or on a scheduled basis. Each target database depends upon its associated transfer definition. Multiple target databases can be created from a single source database. Each target contains a different subset (or the same subset, if multiple similar target databases are required) and is created and maintained with a different definition and schedule. Users choosing to maintain data definitions from the target database in the target system's Common Data Dictionary/Plus (CDD/Plus) may do so by using the INTEGRATE command of the VAX Rdb/VMS SQL or RDO utility.

VAX DATATRIEVE

SPD: 25.44
UPI: 898

VAX DATATRIEVE is a query and report system for the VMS operating system. It provides a uniform access method for data stored by RMS, VAX Rdb/VMS, and VAX DBMS files on VMS and data residing in certain IBM mainframe databases accessed through VIDA for DB2. Using VAX DATATRIEVE, a novice or experienced user can retrieve or modify data without considering the underlying storage method or physical location.

VAX DATATRIEVE presents information in several different formats. Information can be displayed using simple defaults or can be reported on through a more flexible report writer. Information can be displayed on a terminal or workstation, printed on a hard-copy device, or written to a file. Information can also be displayed with user-defined VAX FMS and VAX TDMS forms or presented graphically. Hard copy of the graphic display can be printed on a printer attached to the terminal. VAX DATATRIEVE also provides an efficient way to access information stored on other VAX or PDP-11 systems linked by DECnet.

VAX DATATRIEVE can be used interactively to retrieve, modify, store, or delete data using a simple set of commands. Frequently used combinations of commands can be stored as named procedures and invoked by name. Programs written in other VAX languages can call VAX DATATRIEVE, allowing them to be independent of underlying data storage methods and physical location.

(Continued)

VAX DATATRIEVE *(Continued)*

A DECwindows interface to VAX DATATRIEVE is provided. This allows the user to perform a subset of the DATATRIEVE functions using menu bars, scroll bars, pop-up menus, pull-down menus, and buttons. Data Dictionary

VAX DATATRIEVE is dictionary driven. Data descriptions are stored in and retrieved from VAX CDD/Plus. VAX DATATRIEVE includes commands to store, examine, modify, and delete definitions in the dictionary and can use definitions stored by other VAX layered products, such as the VAX DBMS Data Definition Language (DDL) or VAX Rdb/VMS metadata definitions.

VAX DATATRIEVE includes full support for DMU format dictionaries. It includes support for record and domain definitions in CDO format dictionaries, including the ability to access shareable fields. Relationship tracking is also supported for these entities.

VAX DBMS (Database Management System)

SPD: 25.48
UPI: 899 (Development)
915 (Runtime)

VAX DBMS (Database Management System) is a multiuser, general-purpose, CODASYL compliant database management system for accessing and administering databases ranging in complexity from simple hierarchies to complex networks with multilevel relationships. It supports full concurrent access in a multiuser environment without compromising the integrity and security of the user's databases.

Features include full concurrent access capabilities (storage, retrieval, update, and deletion) in a multiuser environment; record locking and journaling; automatic transaction and verb rollback; multiple database support; Two Phase Commit capability automatically commits or rolls back updates across multiple databases in one transaction; full VAXcluster support, including automatic recovery upon node failure; integration with VAX Common Data Dictionary/Plus (VAX CDD/Plus) facility; schema, subschema, storage schema, and security schema data definition languages (DDLs); FORTRAN Data Manipulation Language (FDML); callable interpretive interface for VAX languages that adhere to the VAX calling standard; automatic subschema definition extraction from the CDD for BASIC, BLISS, C, COBOL, DIBOL, MACRO, Pascal, PL/I, and VAX Ada when using the high level call interface or DML preprocessor.

Other features include VAXcluster support, a utility command language, an interactive database query utility, online and incremental database verification, full and incremental database backup and restore, initial load utility, an unload utility, BATCH RETRIEVAL ready mode, space area management, Boolean record selection, data compression, direct record access, automatic expansion of large records, simple restructuring, sorted sets, and DECnet database access.

VAX DBMS components include a DDL compiler, a database control system, a FORTRAN DML preprocessor, a generic DML preprocessor, an interactive DML utility, a database monitor, and a database operator utility. Also included are DBMSERVER, HELP, security, a four-part data definition language, data manipulation facilities, and a run-time environment.

VAX DIBOL

SPD: 25.49
UPI: 018

VAX DIBOL is a high-level procedural language designed specifically for interactive business data processing. It runs under the VMS Operating System, taking full advantage of the system facilities.

VAX DIBOL is a superset of the DIBOL-83 definition. VAX DIBOL is highly compatible with DIBOL implementation on other operating systems including CTS-300, RSTS/E, Micro/RSTS, RSX-11M-PLUS, Micro/RSX.

VAX DIBOL includes support for several tools and utilities on VMS including the VAX Language-Sensitive Editor, VAX Debugger, and the VAX Performance Coverage Analyzer.

VAX DIBOL also includes support for the current American National Standard for DIBOL, as well as the 1988 ANSI DIBOL Standard, X3.165-1988.

VAX DIBOL provides efficient terminal handling and efficient access to the VAX Record Management Services (RMS). RMS provides access to sequential, relative and indexed file organizations. The .INCLUDE directive allows access to common record definitions stored in the VAX Common Data Dictionary (CDD). Other facilities such as VAX DATATRIEVE, VAX DBMS, VAX FMS and VMS Run-Time Library routines are available as external subroutine calls.

VAX DIBOL supports a set of language statements commonly referred to as structured constructs. These statements are designed to complement and facilitate desirable programming practices.

The DIBOL compiler reads a source program and produces a shareable object module. The compiler is capable of producing a source listing with embedded diagnostics and a cross reference listing. Object modules produced by the compiler conform to the VAX Procedure Calling Standard and may be linked with native mode object modules produced by other VAX language processors.

The VAX DIBOL product includes a compiler, a run-time library, external subroutine libraries, a message manager for communicating between programs, a program to monitor the activities of the message manager, and programs that provide access to the VAX SORT using command files that are compatible with other DIBOL products.

VAX DIBOL also includes a menu facility, support for long file names (up to 39 characters in the "name" portion of the filespec) and an ISMCRE subroutine which allows creation of RMS indexed files under DIBOL program control.

The VAX DIBOL compiler generates debug records for use with the VAX Symbolic Debugger, including support for source line debugging.

VAX DOCUMENT

SPD: 27.55
UPI: VEE

VAX DOCUMENT is a style-based, batch-oriented, document composition system. It is designed to aid VMS users in the production of single manuals, large documentation sets, or specifications, and it supports hardcopy and online output. VAX DOCUMENT runs on a wide range of Digital configurations, including VAXclusters. It can be used from any of Digital's standard terminals, and it can create files for hardcopy output to any Digital line printer or laser printer, or Bookreader files for online viewing on a DECwindows workstation.

VAX DOCUMENT provides a complete, high-end documentation product that automates the production of large, format-intensive, technical documentation from the first entry of written material to the final output of formatted hardcopy or online documentation. VAX DOCUMENT is designed for use by members of the team of people who contribute to a technical document during its life cycle; engineers, writers, editors, or final production specialists. Facilities are provided to create, maintain, revise, format, and print complex technical documents efficiently. This provides greater control over the entire documentation process while reducing time-to-market and costs.

VAX DSM

SPD: 25.08
UPI: 130
YP2 (Runtime)

VAX DSM (Digital Standard MUMPS) is an implementation of the ANSI Standard Specification for MUMPS (X11.1-1990) that is layered on the VMS operating system. It is a high level interpretive programming language and a multiuser data management system in which many users can share a common database. VAX DSM software supports a superset of the ANSI MUMPS specification and fully uses the capabilities of the VMS operating system.

The VAX DSM utility set includes the DSM Application Software Library (DASL) software. The DASL software is an application creation tool which combines a Data Dictionary, Screen (form) Compiler, Report Compiler, and an end user SQL compliant Query Driver. DASL software uses code generation techniques to transform DASL commands and SQL statements into efficient MUMPS code.

The VAX DSM language couples the flexible processing of variable length string data with a high-performance database system, making interactive database application systems easier to implement and maintain.

VAX Rdb/ELN

SPD: 28.03
UPI: D07 (Developmet)
D08 (Target system)

VAX Rdb/ELN is a relational database management system designed for dedicated applications on systems running in the VAXELN application environment.

VAX Rdb/ELN applications are developed using the VAXELN Toolkit on a host VMS system. The resulting bootable, VAXELN-based Rdb/ELN applications are then moved to the VAXELN target system using disk media or an Ethernet Local Area Network (LAN) link. The application program executes on the target system as a dedicated database system. The network link to the host development system may be used for remote debugging.

Users are expected to have the necessary hardware to provide both host development and target execution environments. Rdb/ELN cannot be run in the development environment other than for debugging purposes. Debugging an application in this manner is not a feature of VAXELN, as VAXELN applications cannot run on VMS.

VAX Rdb/VMS

SPD: 25.59
UPI: VD2 (Development)
VCL (Interactive)
358 (Runtime)

VAX Rdb/VMS is a full-function, SQL-based relational database management system designed for the VMS operating system. It is intended for general purpose, multiuser, centralized or distributed applications.

VAX Rdb/VMS supports a complete set of languages, utilities and precompilers that enable users to maintain and manipulate databases. VAX Rdb/VMS implements ANSI/ISO SQL as its standard interface to the database.

VAX Rdb/VMS also includes SQL/Services, a client/server protocol that provides remote access to VAX Rdb/VMS databases from various desktop platforms.

VAX Rdb/VMS implements the Digital Standard Relational Interface (DSRI). DSRI is an architecture for relational database management systems, as well as a standard calling mechanism that can be used for DSRI database creation and population. DSRI allows applications running on any VAX or MicroVAX node in a DECnet network to access all other DSRI-compliant databases in the network.

Users can issue DDL statements through the interactive SQL and RDO utilities, the SQL precompilers, or the SQL module language in order to accomplish the following: create schemas (database), tables (relations), views, columns (fields), and indexes (both ascending and descending); create storage areas for tables and indexes; define constraints and triggers in table definitions; grant and revoke access rights to schemas, tables and views; alter definitions of tables, columns, storage areas, and access rights; delete definitions of tables, views, columns, indexes, constraints, triggers, storage areas, and access rights; restructure schemas on-line, without unload/reload; add comments to definitions of tables views, fields, and indexes; and define collating sequences for international character sets.

VAX RMS Journaling

SPD: 27.58
UPI: VDV

VAX RMS Journaling helps maintain the data integrity of RMS files in the event of a number of failure scenarios. Journaling helps to protect RMS file data from becoming lost or inconsistent.

VAX RMS Journaling provides the following three methods of journaling: after-image (AI) journaling provides the ability to redo a series of modifications to a data file. This type of journaling helps recover lost or corrupted files. After-image recovery restores the contents of the file from the point of the latest backup copy of that file; before-image (BI) journaling provides the ability to undo a series of modifications to a data file. This type of journaling allows a file to be returned to a previous known state. This is useful in the event that a file is updated with erroneous data; and recovery unit journaling helps maintain transaction integrity, where a transaction consists of a group of related operations that must be "atomic." That is, either all of the operations complete in their entirety or none of the operations complete. This type of journaling helps prevent data from becoming inconsistent due to the incomplete execution of a transaction.

Journaling is applied on a file-by-file basis. A file can be marked for after-image, before-image, recovery unit journaling, or any combination of these methods. Within a given application, any combination of journaling methods can be used.

VAX Storage Library System

SPD: 29.67
UPI: OL8 (Remote)

VAX Storage Library System (SLS) is a VMS layered software product that provides users with the ability to manage data archiving activities and VMS BACKUP activities on their systems, manage the resulting media and each piece of media's location, and manage the devices associated with the archive or backup activities.

The media that are managed and tracked by VAX SLS software include reel-to-reel magnetic tape, cartridge tape, and optical cartridges. The devices that are managed by VAX SLS software are all VMS-supported reel-to-reel tape drives, all VMS-supported cartridge tape drives (including the TA90 with loader), the RV20 optical drive, and the RV64 optical juke box.

With the VAX Storage Library System software, users are able to maintain a record of all information on BACKUP or archived media and retrieve this information quickly.

VAX System V Volume Shadowing

SPD: 33.25
UPI: VFS

VAX System V Volume Shadowing is an enhancement to the VAX System V operating system developed by Digital Equipment Corporation for VAX processors using Hierarchical Storage Controllers (HSC) with A series disks.

A volume is defined as an entire disk. Volume shadowing is the process of duplicating all data written to a disk volume onto one to three additional volumes. This increases data availability and accessibility and is transparent to the user. VAX System V Volume Shadowing also provides protection from catastrophic loss of data caused by mechanical failure. It does not protect against accidental data deletion, so it should not be used as a substitute for regular backup operations.

A shadow set is a group of one to four physical disk volumes, called members, that are represented by a virtual unit, called the shadow set master. The virtual unit has the same attributes as each of the members. All I/O requests for a shadow set are directed to the virtual unit.

The major features of VAX System V Volume Shadowing are: Increased Data Availability, Increased Data Accessibility, Automatic Failure Recovery, and Application Software Compatibility.

VAX TDMS (Terminal Data Management System)

SPD: 25.71
UPI: 706 (Full development)
711 (Runtime)

VAX TDMS (Terminal Data Management System) is a product designed for the implementation of interactive, forms-intensive applications running on VAX systems. As a terminal subsystem, VAX TDMS can reduce the application development and maintenance effort by replacing application program logic specific to terminal interactions with definitions that are external to the program.

VAX TEAMDATA

SPD: 27.02
UPI: 741

VAX TEAMDATA is an end-user information management product that runs on the VMS operating system.

TEAMDATA provides powerful yet easy-to-use information management capabilities to those who need to use data in their work, but who don't want to do data processing. TEAMDATA lets users easily store and modify data, using a screen-oriented, text-editing style, in a powerful relational database management system (VAX Rdb/VMS).

TEAMDATA helps users share data, stored locally and remotely, in a variety of storage formats. TEAMDATA users can access data stored in Rdb/VMS databases by TEAMDATA or by other Rdb/VMS applications. Through optional use of VAX DATATRIEVE, TEAMDATA allows (read-only) access to data stored in VAX DBMS databases or RMS files which have been defined as DATATRIEVE domains. Through optional use of VIDA, TEAMDATA permits (read-only) access to data in certain remote IBM mainframe databases. Additionally, through optional use of VAX Xway, users can import and export data to and from common spreadsheet and data interchange formats.

TEAMDATA allows users to manipulate their personal data, as well as shared or remote databases, in simple tables, spreadsheets, reports, and business graphs, and to perform complex query and data reduction operations. TEAMDATA users can perform their tasks by selecting items from strip menus, using a command language, or a combination of the two.

TEAMDATA can be used with ALL-IN-1, as an information management option on an ALL-IN-1 menu, or can be installed outside of ALL-IN-1. In addition, TEAMDATA provides the capability to run applications developed using VAX RALLY.

TEAMDATA users can create and maintain data in tables (stored in Rdb/VMS) for private or shared use. Using a text processing style that is consistent with WPS-PLUS function keys, users can edit screens of data without having to learn a complex data manipulation language. Data can be stored, sorted, updated, queried and reported on using menu selections, commands, or a combination of the two.

TEAMDATA provides a basic spreadsheet capability for use in conjunction with tables for ad hoc calculations. TEAMDATA uses compatible menus and screen-editing styles for the creation and modification of both spreadsheets and tables.

Users can create bar, multibar, stacked bar, line, multiline, pie or scatter graphs of data from within tables or spreadsheets. Graphs can be displayed, printed (black and white or color), or saved. Graphs can also be saved and then loaded into VAX DECgraph for modification.

Users can organize tables, spreadsheets, and applications in folders. Folders can be nested hierarchically.

Folders contain a directory of the user's own private information or can include public information for team or work group use.

TEAMDATA users can share Public Folder databases with DECdecision users. Tables in databases created by TEAMDATA or the DECdecision Access component can also be accessed interchangeably by either product.

TEAMDATA users can run VAX RALLY-generated applications. Application developers can create custom applications that include forms, reports, menus, HELP and complex logic. These applications can then be included on a TEAMDATA directory and run by the end-user. Refer to VAX RALLY (SPD 27.03.) for more information. VAX Rally Run-Time system is required in order to run VAX Rally applications from TEAMDATA.

VAX Volume Shadowing

SPD: 27.29
UPI: AB2

VAX Volume Shadowing is a System Integrated Product (SIP) available on VMS systems. VMS Volume Shadowing provides high data availability by ensuring against data loss resulting from media deterioration or through controller or device failure. This prevents storage subsystem component failures from interrupting system or application operation.

Volume shadowing maintains multiple redundant copies of data on a collection of disks called a shadow set. Shadow sets consist of one, two, or three compatible disk volumes which are referred to as shadow set members. This duplication of data provides greater data availability. When data is recorded on more than one disk volume, the data is accessible even when one volume is unavailable. Disk input/output operations continue transparently with the remaining members of the shadow set.

(Continued)

VAX Volume Shadowing *(Continued)*

Because a shadow set is made up of multiple disks containing the same data, the VMS Volume Shadowing software can read from either disk device. The VMS Volume Shadowing software determines which disk to read from, per read operation.

If sections of a volume become unreadable, systems with volume shadowing can read the data from the duplicate and attempt to repair the original by writing the data to good blocks.

VMS system disks and any Files-11 On-Disk Structure 2 (ODS2) data disks can be volume shadowed.

VMS Volume Shadowing requires a minimum of one VAX CPU, one MSCP-compliant mass storage controller, and one Digital Storage Architecture (DSA) disk drive and volume. Although only one disk is required, there must be two or more disk drives and volumes in order to "shadow" or maintain multiple copies of the same data. This configuration provides protection against either failure of a single disk drive or deterioration of a single volume.

Using two controllers provides a further guarantee of data availability in the event of a single controller failure. Using a VAXcluster and multiple controllers provides the greatest data availability.

VIDA for DB2

SPD: 25.E7
UPI: VTW (Client)
VTX (Server)

VIDA for DB2 is an interoperability product which permits access to IBM DB2 databases resident on IBM mainframe systems. VIDA for DB2 provides transparent, direct, read-only access to DB2 databases from VAX based applications. VIDA for DB2 is layered within VAX Rdb/VMS and can be accessed by most applications and tools which work with VAX Rdb/VMS. VIDA for DB2 users can access IBM-resident DB2 data using products such as VAX RALLY, VAX DATATRIEVE, VAX TEAMDATA, DECdecision, the VAX Rdb/VMS utilities including interactive SQL and RDO, and VAX Data Distributor, as well as 3GL applications with embedded SQL or RDO.

VIDA for DB2 is engineered using a client/server architecture. It consists of two component products and uses Digital's DECnet/SNA interconnect products. VIDA Client for DB2 (hereafter referred to as VIDA Client) is a VAX resident product that accepts requests for DB2 data from VAX applications. VIDA Client converts the requests into DB2 SQL and passes the requests to the IBM-based component, VIDA Server for DB2 (hereafter referred to as VIDA Server). VIDA Client and VIDA Server communicate using a DECnet/SNA Gateway or VMS/SNA (hereafter referred to as a gateway) and the DECnet/SNA VMS APPC/LU6.2 Programming Interface (hereafter referred to as APPC/LU6.2 PI). VIDA Server submits each request to DB2 using the dynamic SQL interface. Data obtained from DB2 is passed back to VIDA Client through the gateway, and VIDA Client returns the data to the requesting application. The application can use the accessed data as it would any locally accessed data. For example, the data can be stored in a VAX database or VAX RMS file, or it could be displayed on a screen or printed.

VIDA Client runs under VMS on VAX, MicroVAX, and VAXstation systems. VIDA Server runs as a CICS transaction on IBM System/370 mainframe systems running the IBM MVS/XAT or MVS/ESAT operating systems.

DEC IEZ11 Class Driver for VMS

SPD: 31.41
UPI: YEH

DEC IEZ11 Class Driver for VMS is a VMS layered product which is part of the IEZ11 option. The IEZ11 option includes the SCSI488/D bus converter and the IEZ11 software.

The DEC IEZ11 Class Driver allows an application written in a higher-level language or in MACRO-32 to monitor, control, and interface with IEEE488 devices using VMS QIO system calls. The driver adheres to the VMS SCSI device architecture.

The IEZ11 driver supports most functions of the IEx11 driver. The majority of IEx11 applications can be converted to run on the IEZ11 with only minor modifications.

DEC TM32 Software for VMS

SPD: 31.45
UPI: VZU

DEC TM32 Software for VMS includes the Port Software Driver (PL Driver) necessary to operate the TM32 tape controller hardware on any VAXBI bus system using the VMS operating system. The software driver specifically allows the reading and writing of record sizes larger than 64K bytes through the use of special QIO calls. Normal size records (less than or equal to 64K) can also be handled by using the standard QIO calls. Buffered chaining is supported by the driver, which effectively eliminates a maximum record size.

Demonstration programs written in FORTRAN and C are included to show users how software should be written for chained and nonchained buffers, in order to make maximum use of the TM32 Software Driver functionality.

DEC Token Ring Network Device Driver for VMS

SPD: 36.32

DEC Token Ring Network Device Driver for VMS (TRDRV V/V) supports suitably configured Q-bus MicroVAX 3000 and VAXserver 3000, and VAX 4000 and VAXserver 4000 systems on 4 Mbps or 16 Mbps 802.5/Token Ring LANs as DECnet Phase IV systems. TRDRV V/V driver also supports VMS $QIO and Alternative Start I/O interfaces for user-supplied applications. The TRDRV V /V driver product includes on-line diagnostics, installation verification procedures, and host loadable DEQRA microcode.

DEC Wide Area Network Device Drivers for ULTRIX

SPD: 32.33
UPI: YMK (VAX)
YML (RISC)

DEC Wide Area Network Device Drivers for ULTRIX contains the ULTRIX Device Drivers and specific datalink protocol support for Digital Equipment Corporation's synchronous communications options when used on VAX and Digital RISC systems.

DECnet Router Server

SPD: 30.34
UPI: 725

DECnet Router Server runs on an Ethernet Communications Server hardware unit to provide DECnet routing functions in a network of one or more host computers. These hosts may be Phase IV routing nodes or end nodes (for example, DECnet-RT, Version 2.1 and DECnet/E, Version 2.7). DECnet Router Server connects directly to the Ethernet to provide routing to nodes off the Ethernet connected through the unit's synchronous or asynchronous lines.

Phase IV DECnet networks are hierarchical networks that can be segmented into areas. DECnet Router Server supports both intra-area (Level 1) and interarea (Level 2) routing for transporting messages between nodes and areas. End nodes connected directly to an Ethernet must use DECnet Router Servers or Phase IV host routing nodes on the same Ethernet for message routing off that Ethernet.

A routing node is not required on an Ethernet if the end nodes connected to that Ethernet communicate only with each other. However, if the Ethernet directly connects nodes with different area addresses, an area routing node is required to transport messages between those areas. Use of DECnet Router Server offloads certain communications processing from host nodes that would otherwise serve as routing nodes on the Ethernet.

DECnet Router Server implements Phase IV DECnet asynchronous and synchronous DDCMP routing and network management. Through the use of Phase IV DECnet protocols, DECnet networks can contain up to 63 areas, each containing up to 1023 nodes, given proper network planning. DECnet Router Server can be used to connect to Phase III nodes, providing migration of Phase III networks with connectivity to Phase IV Ethernet nodes.

DECrouter 200

SPD: 27.72
UPI: VDJ (VMS and MicroVMS)
VDK (ULTRIX-32)
A33 (MS-DOS and PC-DOS)

DECrouter 200 is an Ethernet-based DECnet asynchronous router. This router interconnects up to eight DECnet nodes connected to the asynchronous DDCMP connections.

DECrouter 200 is also connected to the Ethernet and provides access to the Ethernet (and the wider DECnet network) to the nodes attached to the asynchronous ports. These nodes can be located either locally, through dedicated wiring such as existing office wiring, or remotely, through modem connections.

DECrouter 200 supports intra-area (level 1) routing of messages between DECnet end nodes. These nodes can be Phase III, Phase IV, or Phase IV+ routing nodes or end nodes in the same area. DECrouter 200 offloads routing-related communications from hosts that would otherwise serve as routing nodes on the Ethernet-based DECnet LAN.

DECrouter 200 can act as the designated router for an Ethernet segment. A designated router is necessary for end nodes to communicate with nodes off the Ethernet.

DECrouter 200 incorporates a remote monitor utility to monitor its current state. This remote monitor contains the same displays that are available through the local monitor.

DECrouter 250

SPD: 32.15
UPI: YG6

DECrouter 250 is a Local Area Network-based DECnet asynchronous/synchronous router. This Phase IV/IV+, level 1/level 2 router is capable of supporting up to eight serial ports and providing DECnet nodes running DDCMP with access to the Ethernet/802.3 and larger DECnet networks.

The DECrouter 250 provides access to Phase IV/IV+ DECnet nodes on a Local Area Network (LAN) and to Phase III or Phase IV/IV+ DECnet nodes over asynchronous/synchronous lines. These nodes can be located either locally via dedicated wiring, or remotely via modem connections.

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DECrouter 250 *(Continued)*

The DECrouter 250 performs adaptive routing utilizing all of the eight asynchronous/synchronous lines and the Ethernet/802.3 port. In the case where communications to an end node might pass through multiple routers, the DECrouter 250 has the capability of choosing the least-cost path or re-routing in case of a line failure.

The DECrouter 250 supports intra-area (level 1) and inter-area (level 2) routing of messages between DECnet end nodes. These nodes can be Phase III/IV/IV+ routing nodes or end-nodes. Use of the DECrouter 250 offloads routing related communications from hosts that would otherwise serve as routing nodes on the Local Area Network-based DECnet LAN.

A major security feature of the DECrouter 250 is support for modem dial back. This feature allows network managers to control access to their DECnet networks more tightly.

The DECrouter 250 has the ability to be downline loaded over the serial lines as well as its Ethernet/802.3 connector.

DECrouter 2000

SPD: 28.85
UPI: VI8

DECrouter 2000 is a communications product that provides a routing service for the Local Area Network (LAN). This allows communication with nodes outside the LAN within a Wide Area Network (WAN). By using a DECrouter 2000, the routing load on the other Ethernet nodes can be reduced, releasing these resources for other applications.

The DECrouter 2000 provides access to and from Phase IV DECnet nodes on a Local Area Network (LAN) to Phase III or Phase IV DECnet nodes over synchronous lines. These nodes may be located either locally, via dedicated wiring, or remotely via modem connections. Note that LAN refers to any Local Area Network that conforms with the Ethernet, IEEE 802.3, or ISO 8802/3 standards.

The DECrouter 2000 software product runs on the DEC MicroServer (DEMSA) and DEC MicroServer-SP (DEMSB) hardware units. These units contain an Ethernet interface port (IEEE 802.3 compatible); the DEC MicroServer has four synchronous communications ports, and the DEC MicroServer-SP has a single synchronous port.

The DECrouter 2000, on the DEC MicroServer, supports the four synchronous lines at speeds up to 64K bits per second, two synchronous lines at speeds up to 384K bits per second, or one synchronous line at speeds up to 2.048M bits per second. The DECrouter 2000, on the DEC MicroServer-SP, supports the single synchronous line at speeds up to 64K bits per second. Communication over the synchronous lines is full- or half-duplex, and full modem control is supplied on all synchronous line(s). The synchronous port(s) can operate as DDCMP point-to-point or multipoint links, and can communicate with all supported synchronous Digital DDCMP products, excluding the DMC11. On DDCMP multipoint links, the DECrouter 2000 can act only as a tributary.

DECserver 90TL for VMS, ULTRIX, and MS-DOS

SPD: 38.71
UPI: MJP

DECserver 90TL for VMS, ULTRIX, and MS-DOS provides concurrent Local Area Transport (LAT) and Telnet TCP/IP protocol support from a DECserver 90TL communications server to enable connectivity to host systems that utilize LAT or TCP/IP protocols. The TCP/IP protocol suite is used to connect to UNIX host systems and other host systems that support the TCP/IP protocol suite.

The DECserver 90TL Communications Server is an Ethernet Communications Server for Ethernet Local Area Networks. The DECserver 90TL provides a convenient method to logically connect up to eight digital asynchronous terminals to one or more service nodes (hosts) on an Ethernet. Once the terminal is connected, a user can utilize application programs and utilities as though the terminal was directly connected to a host via a DMF32, DHU11, or DHV11/DHQ11 device, with a few exceptions. Thus, it may be possible to utilize the DECserver 90TL to connect all terminals to service nodes in place of traditional interfaces, except for host console terminals.

In addition, the DECserver 90TL provides IP end-node routing via SLIP. Up to eight TCP/IP systems can be connected to the serial ports of the DECserver 90TL. These systems can run IP applications (such as Telnet, FTP, X-Windows, etc.) on the serial line and communicate with other TCP/IP services on the network.

The DECserver 90TL uses MJ8 (similar to RJ45 jacks used in telephone jacks) for the attachment of asynchronous devices. The DECserver 90TL utilizes the DEC 423-A electrical interface standard for local connections. DEC 423-A is compatible with the DEC 232-D interface and supports DTR/DSR (Data Terminal Ready/Data Set Ready) signals. DEC 423- A supports longer cable runs and higher signaling speeds.

DECserver 100 for VMS and MicroVMS

SPD: 27.41
UPI: 925

DECserver 100 for VMS and MicroVMS is a network terminal switch for Ethernet local area networks. DECserver 100 provides a convenient method to logically connect up to eight Digital asynchronous terminals to one or more service nodes (hosts) on an Ethernet. When the terminal is connected, users can run application programs and utilities as though the terminal were directly connected to a host through a DZ11, DMF32, or DH11 device, with some limitations. DECserver 100 can connect all terminals to service nodes in place of traditional interfaces, except for host console terminals.

DECserver 100 also allows for VMS host-initiated connections to asynchronous printers. A special print symbiont on VMS service nodes can initiate connections to asynchronous printers connected to DECserver ports. This allows certain asynchronous printers to be distributed throughout the network and accessed transparently by service node users. Incoming server connect requests are queued in FIFO (first in/first out) order.

DECserver 100 implements the local area transport (LAT) protocol for communicating with service nodes that implement this protocol on the same Ethernet. This interface has been optimized for high terminal I/O performance over an Ethernet, while reducing host CPU cycles required to handle interrupts. Therefore, under most I/O loading conditions a significant performance gain may be realized by using DECserver 100 over direct terminal connections through DZ11s.

Software that runs on DECserver 100 is downline loaded over the network from a Phase IV DECnet load host. Terminal access using DECserver 100 does not require DECnet running in the same service node; LAT uses the Ethernet addressing mechanism to transport terminal messages.

Features include login load balancing, multiple terminal sessions, automatic login failover, and remote printer support.

DECserver 200 for ULTRIX-32

SPD: 27.54
UPI: VDE

DECserver 200 for ULTRIX-32 is a network terminal switch for Ethernet Local Area Networks. The DECserver 200 provides a convenient method to logically connect up to eight Digital asynchronous terminals to one or more service nodes (hosts) on an Ethernet. Once the terminal is connected, a user can utilize application programs and utilities as though the terminal were directly connected to a host via a DZ11, DMF32, or DHU11 device, with a few exceptions. Thus, it may be possible to utilize the DECserver 200 to connect all terminals to service nodes in place of traditional interfaces, except for host console terminals. Remote connection via dial-in modems is fully supported.

The DECserver 200 also allows for ULTRIX host-initiated connections to asynchronous printers. This allows the printers to be distributed throughout a facility and accessed transparently by service node users. Incoming host-initiated connect requests may be queued FIFO at the server.

The DECserver 200 also provides the capability to connect host systems that do not support the LAT protocol, Digital personal computers, and dial out modems directly to ports on the server. Interactive server users can issue commands to connect to services which are offered on such ports. Port-to-port connections on the same server are also supported.

The DECserver 200 implements the Local Area Transport (LAT) protocol for communication with service nodes that implement this protocol on the same Ethernet. This interface has been optimized for high terminal I/O performance over an Ethernet, while reducing host CPU cycles required to handle interrupts. Hence, under most I/O loading conditions, a significant performance gain may be realized by using the DECserver 200 versus direct terminal connections via DZ11s.

DECserver 200 for VMS and MicroVMS

SPD: 27.53
UPI: VCB

DECserver 200 for VMS and MicroVMS is a network terminal switch for Ethernet Local Area Networks. The DECserver 200 provides a convenient method to logically connect up to eight Digital asynchronous terminals to one or more service nodes (hosts) on an Ethernet. Once the terminal is connected, a user can utilize application programs and utilities as though the terminal were directly connected to a host via a DZ11, DMF32, or DHU11 device, with a few exceptions. Thus, it may be possible to utilize the DECserver 200 to connect all terminals to service nodes in place of traditional interfaces, except for host console terminals. Remote connection via dial-in modems is fully supported.

The DECserver 200 also allows for VMS host-initiated connections to serial printers. A special print symbiont on VMS service nodes can initiate connections to serial printers connected to DECserver 200 ports. This allows the printers to be distributed throughout a facility and accessed transparently by service node users. Incoming host-initiated connect requests may be queued FIFO (first in/first out) at the server.

The DECserver 200 also provides the capability to connect host systems that do not support the LAT (Local Area Transport) protocol, Digital personal computers, and dial-out modems directly to ports on the server. Interactive server users can issue commands to connect to services which are offered on such ports. Port-to-port connections on the same server are also supported.

The DECserver 200 implements the Local Area Transport protocol for communication with service nodes that implement this protocol on the same Ethernet. This interface has been optimized for high terminal I/O performance over an Ethernet, while reducing host CPU cycles required to handle interrupts. Hence, under most I/O loading conditions, a significant performance gain may be realized by using the DECserver 200 versus direct terminal connections via DZ11s.

DECserver 250 for ULTRIX-32

SPD: 38.07
UPI: VTN

DECserver 250 for ULTRIX-32 is a network server for printers for Ethernet Local Area Networks. DECserver 250 provides a method to logically connect the following: two Digital asynchronous parallel printers (using Dataproducts parallel interface standard); three Digital asynchronous serial printers; and a Digital asynchronous serial printer or terminal with modem control to one or more service nodes (hosts) on an Ethernet.

DECserver 250 implements the Local Area Transport (LAT) protocol for communication with service nodes that implement this protocol on the same Ethernet.

Software that runs on DECserver 250 is down-line loaded over the network from either an ULTRIX-32 load host or from any other supported load host that runs Phase IV DECnet. DECnet is not required for ULTRIX-32 load hosts.

A line printer daemon on ULTRIX-32 service nodes initiates connections to asynchronous printers connected to DECserver 250 ports. Users can establish a logical connection from any service node that implements the LAT protocol on the same Ethernet LAN. The terminal connected to the server can be used to make multiple connections to the same or to different service nodes on the Ethernet. Only one connection per asynchronous printer can be made.

DECserver 250 offers load balancing, a function that dynamically spreads the user load evenly among service nodes that offer the same service.

An online reference HELP facility with tutorial HELP feature is available on the printer/terminal port. The remaining ports do not have access to the HELP facilities.

DECserver 250 maintains permanent characteristics in nonvolatile memory, which is retained even when the power is disconnected. Characteristics governing the operation of the DECserver 250 ports can be displayed interactively from the printer/terminal port when connected to a terminal. Characteristics other than permanent can be set up by the user or server manager.

In terms of throughput of the printer ports, the DECserver 250 parallel ports can support up to 2000 lpm. All ports can be accessed at their rated speeds; however, the DECserver 250 overall performance is a factor of the CPU and network utilization.

DECserver 250 for VMS

SPD: 25.J5
UPI: VTM

DECserver 250 for VMS is a network server for printers for Ethernet Local Area Networks. The DECserver 250 provides a convenient method to connect logically; two Digital asynchronous parallel printers (using Dataproducts parallel interface standard), three Digital asynchronous serial printers, and a Digital asynchronous serial printer or terminal with modem control to one or more service nodes (hosts) on an Ethernet.

(Continued)

DECserver 250 for VMS *(Continued)*

The DECserver 250 implements the Local Area Transport (LAT) protocol for communication with service nodes that implement this protocol on the same Ethernet.

Software that runs on the DECserver 250 is down-line loaded over the network from a Phase IV DECnet load host.

A print symbiont on VMS service nodes initiates connections to asynchronous printers connected to DECserver 250 ports.

Users can establish a logical connection from any service node that implements the LAT protocol on the same Ethernet LAN. The terminal connected to the server can be used to make multiple connections to the same or to different service nodes on the Ethernet. Only one connection per asynchronous printer can be made.

The DECserver 250 offers load balancing, which is a function that dynamically spreads the user load evenly among service nodes that offer the same service.

The LAT Control Program (LATCP) is used by the System Manager to establish service definitions.

A full on-line reference HELP facility, with tutorial HELP feature, is available on the printer/terminal port. The remaining ports do not have access to the HELP facilities.

The DECserver 250 maintains permanent characteristics in non-volatile memory, which is retained even when the power is disconnected.

Characteristics governing the operation of the DECserver 250 ports can be displayed interactively from the printer/terminal port when connected to a terminal. Characteristics other than permanent may be setup by the user or Server Manager.

In terms of throughput to the printer ports, the DECserver 250 supports the equivalent of two 1200 LPM printers, or one 2000 LPM printer running at full speed, or aggregate transfer rates of 19,200 baud on two of the serial ports and 9600 baud on the remaining two serial ports.

DECserver 300 for ULTRIX-32

SPD: 25.J2
UPI: VTV

DECserver 300 for ULTRIX-32 Terminal Server is a network terminal switch for Ethernet Local Area Networks. It provides a convenient method to logically connect up to 16 Digital asynchronous terminals to one or more service nodes (hosts) on an Ethernet. Once the terminal is connected, a user can utilize application programs and utilities as though the terminal was directly connected to a host via a DMF32, DHU11, or DV11/DHQ11 device, with a few exceptions. Thus, it may be possible to utilize the DECserver 300 to connect all terminals to service nodes in place of traditional interfaces, except for host console terminals and remote connection via dial-in modems which is not supported.

DECserver 300 uses Modified Modular Jacks (MMJs) for the attachment of serial devices. The MMJ segregates a data from a voice connection. DECserver 300 utilizes the EIA 423-A electrical interface standard for local connections. EIA 423-A is compatible with the EIA 232-D interface and supports DTR/DSR (Data Terminal Ready/Data Set Ready) signals. EIA 423-A supports longer cable runs and higher signaling speeds. Port-to-port connections on the same server are supported.

DECserver 300 implements the Local Area Transport (LAT) protocol for communication with service nodes that implement this protocol on the same Ethernet. DECserver 300 also implements and supports the Terminal Device/Session Management Protocol (TD/SMP) to manage multiple sessions at the device level.

Features of DECserver 300 include terminal connection management, load balancing, multiple sessions, multiple session management, outbound connection queues, and welcome identification. Other features include local and service modes, autoconnection, automatic session failover, groups, security, an online HELP facility, directory service, and more.

DECserver 300 for VMS and MS-DOS

SPD: 25.J1
UPI: VTU

DECserver 300 for VMS and MS-DOS software provides concurrent Local Area Transport (LAT) and Telnet TCP/IP protocol support from a DECserver 300 terminal server to enable connectivity to host systems that utilize LAT or TCP/IP protocols. The TCP/IP protocol suite is used to connect to UNIX host systems and other host systems that support the TCP/IP protocol suite.

The DECserver 300 Terminal Server is an Ethernet Communications Server for Ethernet Local Area Networks. The DECserver 300 provides a convenient method to logically connect up to sixteen Digital asynchronous terminals to one or more service nodes (hosts) on an Ethernet. Once the terminal is connected, a user can utilize application programs and utilities as though the terminal was directly connected to a host via a DMF32, DHU11 or DHV11/DHQ11 device, with a few exceptions. Thus, it may be possible to utilize the DECserver 300 to connect all terminals to service nodes in place of traditional interfaces, except for host console terminals and remote connection via dial-in modems which is not supported.

The DECserver 300 uses MMJs (Modified Modular Jacks) for the attachment of serial devices. The MMJ segregates a Data from a Voice connection. The DECserver 300 utilizes the EIA 423-A electrical interface standard for local connections. EIA 423-A is compatible with the EIA 232-D interface and supports DTR/DSR (Data Terminal Ready/Data Set Ready) signals. EIA 423 A supports longer cable runs and higher signaling speeds.

The DECserver 300 does not support connections to wide-area networks via modems. However, it does provide the capability for connections to non-LAT hosts.

The DECserver 300 also allows for host-initiated connections to serial printers. A print symbiont on service nodes can initiate connections to serial printers connected to DECserver 300 ports. This allows the printers to be distributed throughout a facility and accessed transparently by service node users. Incoming host-initiated connect requests may be queued FIFO at the server.

DECserver 500 for ULTRIX

SPD: 33.54
UPI: 03K

DECserver 500 for ULTRIX is an Ethernet Communications Server for Ethernet Local Area Networks (LANs). The DECserver 500 series server can provide up to 128 EIA-423-A or 64 EIA-232 asynchronous port connections to Digital asynchronous terminals. Both EIA-232, via the 8 port CXY08 communication option card, and EIA-423-A, via the 16 port CXA16 communication option card and EIA-422 16 port CXB16 communication option card can be mixed together in any combination from two to eight cards in one server. The DECserver 500 series server provides a convenient method to connect logically up to 128 Digital asynchronous terminals to one or more service nodes (hosts) on an Ethernet.

(Continued)

DECserver 500 for ULTRIX *(Continued)*

Once the terminal is connected, a user can use application programs and utilities as though the terminal was directly connected to a host. Thus, it may be possible to use the DECserver 500 series server to connect all terminals to service nodes in place of traditional interfaces, except for host console terminals. Remote connection via dial-in modems is fully supported. See the Restrictions section for limitations.

The DECserver 500 series server also allows for ULTRIX host-initiated connections to asynchronous printers. A print symbiont on ULTRIX service nodes can initiate connections to asynchronous printers connected to DECserver 500 series ports. This allows the printers to be distributed throughout a facility and accessed transparently by service node users. Incoming host-initiated connect requests can be queued FIFO at the server.

The DECserver 500 series server also provides the capability to connect host systems that do not support the LAT protocol, Digital personal computers, and dial-out modems directly to ports on the server. Interactive server users can issue commands to connect to services that are offered on such ports. Port-to-port connections on the same server are also supported.

The DECserver 500 series server implements the Local Area Transport (LAT) protocol for communication with service nodes that implement this protocol on the same Ethernet. This interface has been optimized for high terminal I/O performance over an Ethernet, while reducing host CPU cycles required to handle interrupts. Hence, under most I/O loading conditions, a signifi-cant performance gain may be realized by using the DECserver 500 series servers as opposed to direct terminal connections.

The DECserver 500 series server implements the On-Demand Loading (ODL) font loading protocol, which allows Asian terminals that implement the ODL protocol to communicate with a suitable host via a terminal server. The Asian terminals will be able to request font definitions from a suitable host when connected to a DECserver 500 series server.

The DECserver 500 series server also implements and supports the Terminal Device/Session Management Protocol (TD/SMP) to manage multiple sessions at the device level. The DECserver 500 series servers provide the ability to communicate with devices that also implement this protocol, and assist in the management of multiple sessions for these devices. By implementing this protocol, the DECserver 500 series servers can permit attached devices to maintain screen and keyboard context for multiple LAT sessions, as well as allow these devices to run multiple LAT sessions concurrently.

DECserver 500 for VAX VMS and MicroVMS

SPD: 26.97
UPI: 03K

DECserver 500 for VAX VMS and MicroVMS series server is an Ethernet Communications Server for Ethernet Local Area Networks (LANs). The DECserver 500 series server can provide up to 128 EIA-423-A or 64 EIA-232 asynchronous port connections to Digital asynchronous terminals. Both RS 232, via the 8 port CXY08 communication option card, and EIA-423-A, via the 16 port CXA16 communication option card and EIA-422 16 port CXB16 communication option card can be mixed together in any combination from two to eight cards in one server. The DECserver 500 series server provides a convenient method to connect logically up to 128 Digital asynchronous terminals to one or more service nodes (hosts) on an Ethernet. Once the terminal is connected, a user can use application programs and utilities as though the terminal was directly connected to a host via a DZ11, DMF32, or DHU11 device, with a few exceptions. Thus, it may be possible to use the DECserver 500 series server to connect all terminals to service nodes in place of traditional interfaces, except for host console terminals. Remote connection via dial-in modems is fully supported.

The DECserver 500 series server also allows for VMS host initiated connections to asynchronous printers. A special print symbiont on VMS service nodes can initiate connections to asynchronous printers connected to DECserver 500 series ports. This allows the printers to be distributed throughout a facility and accessed transparently by service node users. Incoming host-initiated connect requests may be queued FIFO at the server.

The DECserver 500 series server also provides the capability to connect host systems that do not support the LAT protocol, Digital personal computers, and dial-out modems directly to ports on the server. Interactive server users can issue commands to connect to services that are offered on such ports. Port-to-port connections on the same server are also supported.

The DECserver 500 series server implements the Local Area Transport (LAT) protocol for communication with service nodes that implement this protocol on the same Ethernet. This interface has been optimized for high terminal I/O performance over an Ethernet, while reducing host CPU cycles required to handle interrupts.

The DECserver 500 series server implements the On-Demand Loading (ODL) font loading protocol, which allows Asian terminals that implement the ODL protocol to communicate with a suitable VMS host via a terminal server. The Asian terminals will be able to request font definitions from a suitable VMS host when connected to a DECserver 500 series server.

The DECserver 500 series server also implements and supports the Terminal Device/Session Management Protocol (TD/SMP) to manage multiple sessions at the device level. The DECserver 500 series servers provide the ability to communicate with devices that also implement this protocol, and assist in the management

The DECserver 500 series server also implements and supports the Terminal Device/Session Management Protocol (TD/SMP) to manage multiple sessions at the device level. The DECserver 500 series servers provide the ability to communicate with devices that also implement this protocol, and assist in the management of multiple sessions for these devices. By implementing this protocol, the DECserver 500 series servers can permit attached devices to maintain screen and keyboard context for multiple LAT sessions, as well as allow these devices to run multiple LAT sessions concurrently.

Software that runs on the DECserver 500 series server is down-line loaded over the network from a Phase IV DECnet load host. Terminal access using the DECserver 500 series server does not require DECnet running in the same service node; LAT uses the Ethernet addressing mechanism to transport terminal messages.

For wide area network (WAN) communications, terminal users can connect to a LAN service node running DECnet where they can "SET HOST" to a remote system via the DECnet network terminal protocol. If this system has the prerequisite X.29 or SNA 3270 access routines, a terminal user could communicate to a remote SNA or X.25 host through the appropriate gateway and this intervening host. A DECserver 500 series terminal user cannot communicate directly to remote hosts through DECnet Routers or X.25/SNA Gateways. Wide area network traffic will not provide the same high level of performance as local terminal connections, due to the additional DECnet and internet protocol overhead.

DRB32 VMS Drivers

SPD: 27.69
UPI: VF5

DRB32 VMS Drivers supports the DRB32 options (DRB32-M, DRB32-E, and DRB32W) under the VMS operating system. The DRB32-M is a general purpose parallel port that provides a 32-bit high speed interface between the VAXBI and a user's peripheral. In DMA mode, the DRB32-M can transfer up to 960K bytes of data without processor intervention. The DRB32-M also supports programmed I/O data transfers between a VAX processor and an external device. The DRB32-E an external cable driving option allows for communications with a device outside the system cabinet. The DRB32-W a DR11-W compatible option provides DR11-W like transactions, so that existing DR11-W applications may utilize the higher band-width provided by the VAXBI.

DRB32 VMS DRIVERS provides device drivers and other programs that support the DRB32 under VMS on VAXBI systems. Included in the kit are two working example device drivers; one for the DRB32-M/DRB32-E, and one for the DRB32-W. Also there are example programs that demonstrated the use of the drivers and provides test and installation verification procedures.

The DRB32-M/DRB32-E Driver Features simple interface for user programs, via the $QIO VMS system service. This service can be called from any VMS supported programming language. This allows users to: pre-lock buffers in memory, reducing driver overhead when processing user requests; transfer very large amounts of data, much larger than the DRB32's 982K bytes, by making use of the DRB32's double-buffering capability in longword mode transfers; set up an attention AST, which gives a user program a synchronous notification of external device events; implement its own data transfer protocol, between the user program and the external device. The driver imposes no restrictions on this protocol.

The DRB32-M/DRB32-E Pipelines user I/O requests, keeps the DRB32 and the external device as busy as possible by overlapping driver and user program overhead with data transfers, and allows programmed I/O to either the DRB32's data port, control port, or both. This allows a user program to read or write a longword or word at a time from or to the user device.

The DRB32-W driver is a modified version of the VMS DR11-W driver, with a nearly identical user QIO interface. Existing programs for the DR11-W may require modification to use the DRB32-W driver. The sources to this driver are provided, so that the user has an example of how to modify the DR11-W device handling to use the DRB32-W. Systems that are upgraded to the T1023-YA version of the DRB32-W board will be able to use the word counter functionality included in the example driver source, UQWDRIVER, if so desired.

DRV11-WA/DRV1W ULTRIX Driver

SPD: 32.91
UPI: YLJ (VAX)
YLK (RISC)

DRV11-WA/DRV1W ULTRIX Driver provides a software interface to the DRV11-WA/DRV1W controller hardware. The DRV11-WA/DRV1W hardware is a general-purpose, 16-bit, parallel, direct-memory-access (DMA) data interface. It is capable of being used either as an interface between memory and a user device or as an interprocessor link (non-DECnet) between two systems. The DRV11-WA/DRV1W device is compatible with systems which have the 22-bit Q-bus. For more information about the controller hardware, refer to the *DRV11-WA General Purpose DMA Interface User's Guide.*

The DRV11-WA/DRV1W ULTRIX Driver software allows general access to the features provided by the DRV11-WA/DRV1W devices. The standard ULTRIX system driver calls: open, close, read, write, and ioctl, are provided for controlling and transferring data between the user device or interprocessor link and the ULTRIX operating system. To allow asynchronous operations, the driver has been implemented to be compatible with the ULTRIX nbuf(4) mechanism. For detailed information about the driver, refer to the *DRV11-WA/DRV1W ULTRIX Driver User's and Installation Guide.*

As well as being installable on supported Q-bus systems, the DRV11-WA/DRV1W ULTRIX Driver may be installed on any ULTRIX system with the diskless management services (dms), for booting to supported Q-bus clients.

The DRV11-WA/DRV1W ULTRIX Driver will support up to 4 DRV11-WA/DRV1W controllers per Q-bus system or client.

Ethernet Terminal Server for VMS and MicroVMS

SPD: 27.39
UPI: 726

Ethernet Terminal Server for VMS and MicroVMS is a network terminal switch for Ethernet local area networks. The server provides a method to logically connect up to 32 Digital EIA-232 asynchronous terminals to one or more service nodes (hosts) on an Ethernet. When the terminal is connected to the service node, application programs and utilities are available as though the terminal was directly connected to a host through a DZ11, DMF32, or DHU11 device. Ethernet Terminal Server can connect terminals to service nodes rather than traditional interfaces. Remote connection through dial-in modems is supported.

The server also allows for VMS-host initiated connections to asynchronous printers.

Features include terminal connection management, non-LAT host support, load balancing, multiple sessions, local mode and service mode, autoconnection, and more.

HSC Software

SPD: 30.52
UPI: 926

HSC Software is the software component of a special-purpose hardware and software set that makes up a Hierarchical Storage Controller (HSC). HSC Software is the software executed within the I/O control processor and other peripheral processors of the HSC. The three hardware models of the HSC product family are HSC40, HSC50, and HSC70. The HSC is an intelligent mass storage server, interfacing one or more host computer systems to a set of mass storage devices.

The HSC is an intelligent subsystem because, together with the devices it controls, it is seen by the host computers as a single high-level entity. The host computers send high-level I/O requests to the HSC subsystem and relegate to the subsystem the responsibility for all low-level operations required to implement the high-level requests. Internally, the HSC subsystem utilizes programmed processors to direct and perform its detailed I/O operations.

The HSC arranges its software by function. Major portions of the software include the Disk Server, which services all I/O requests for disk units; the Tape Server, which services all I/O requests for tape units; and the DUP (Diagnostics/Utilities Protocol) Server, which services the host-to utility connection.

HSC attaches to host computer systems through the CI (Computer Interconnect). HSC supports connection to the maximum number of nodes in any valid VAXcluster configuration.

(Continued)

HSC Software *(Continued)*

HSC connects to mass storage devices through the Standard Disk Interface and Standard Tape Interface. The maximum number of disk devices that a single HSC70 can support is 32. The HSC50 supports 24 devices and the HSC 40 supports 12 disk devices.

HSC software converts host requests into device-specific requests and manages the physical activity of the devices, supporting parallel transfers on multiple data channels. The HSC also implements deep buffering (the ability to interpret and prepare for transfer) of commands from hosts.

IEX-VMS-Driver

SPD: 26.30
UPI: 519

IEX-VMS-Driver allows programs written in MACRO-32 and higher level languages (such as VAX FORTRAN, VAX BASIC and VAX PASCAL) to communicate through the IEU11-A or IEQ11-A with devices containing an IEC 625-1 or IEEE Std. 488 interface. This communication is implemented through a choice of direct QIO calls or a set of subroutines callable from high level languages.

The IEX11-A interface is a bit-parallel byte-serial device which can perform transfers in either program interrupt or DMA (direct memory access) mode. Program interrupt is used for transferring commands and addresses, while DMA is used for transferring data. DMA significantly reduces processor loading during the transfer of long data buffers.

The IEX11-A interface contains two independent IEC/IEEE bus controllers, also known as General Purpose Interface Buses (GPIBs). These two controllers may be connected to the same or to different IEC/IEEE buses. Up to 15 devices may be attached to each IEC/IEEE bus.

The IEX11 is most commonly used as Controller-in-Charge, but can also be used when another device is Controller-in-Charge. The Controller-in-Charge directs the sequence of information on the bus.

When the IEX11 acts as Controller-in-Charge, it may request status information from other devices through serial and parallel polling. When the IEX11 is not Controller-in-Charge, it can be polled in either fashion to provide status information.

IXV11/VMS Driver

SPD: 28.28
UPI: VHZ

IXV11/VMS Driver allows programs written in any language supporting the MicroVAX/MicroVMS $QIO System Service to communicate with user devices connected to the IXV11/IXV1S modules. The IXV11 module family is a group of industrial digital input and output, analog input and output, and counter interfaces for Digital's Q-bus machines.

Digital input and output requests support the following modes of operation: read data from one or several IDV1x-A modules; write data to one or several IDV1x-B modules or IDV1x-C modules; read or write fractions of a 16-bit value; and handle interrupts in a user process by AST routines.

Analog input and output requests support the following modes of operation: read data from up to 128 different channels on IAV1x-A, -AA, and IAV1x-C, -CA modules; write data to up to four different channels on IAV1x-B modules; enable automatic gain selection; initiate multiple reads on one channel with one request; and start conversion internally or externally.

The counter functions can start or stop up to five counter channels simultaneously on one IDV1x-D module, count upwards or downwards on a per channel selection and preset every channel with an initial value. Counter functions can also handle counter overflow and underflow in a user AST routine, control by internal or external start signal the count of external events, count selectable internal time intervals upon external control signal (time measurements), and concatenate consecutive counter channels.

KDM70 Software

SPD: 31.62
UPI: YG5

KDM70 Software is the software component of a special-purpose hardware/software set that makes up the DSA XMI storage controller. KDM70 Software is executed by the CVAX Processor of the KDM70. The KDM70 is an intelligent MSCP/TMSCP storage controller which supports RA Series Disks and Storage Arrays, TA Series Tape, and ESE20.

KMV1A LRR Program

SPD: 28.38
UPI: Z74

KMV1A LRR Program is a long range radar protocol microcode for the KMV1A programmable communications controller. The microcode allows the user to perform medium-speed synchronous radar communication in a point-to-point radar environment using the LRR link level protocol. KMV1A LRR Program operates with the KMV1A Support Software Package product, which is comprised of a KMV1A driver program and high level language interface library.

Features of KMV1A LRR Program include framing of variable number (to a maximum of nine) of 13-bit data words; direct memory access for high throughput; support for DTE clock source from 1200 bps up to 4800 bps; modem control, including remote loop or local loop; modem lead change control for carrier detect, ring indicator, clear to send, and data set ready; and line statistics. KMV1A LRR Program transmits and receives data and aborts data transmission and reception.

KMV1A MicroVAX Driver

SPD: 28.23
UPI: VCP

KMV1A MicroVAX Driver provides a mechanism for communication between a MicroVAX host and the KMV1A Programmable Communications Controller. It controls this communication by providing an interface between MicroVAX application programs and microcode being executed in the KMV1A Controller's microprocessor. The communication includes data transfer and the transfer of command, control, and status information to and from the KMV1A Controller. The driver provides the mechanism to load microcode from the host into the KMV1A Controller and to initialize the microcode.

KMV1A MicroVAX Driver consists of the KMV1A driver, an installation verification program, and a demonstration program. Features include initialization of KMV1A microcode, the capability to up-line dump the memory contents of the KMV1A Controller RAM to host memory, a QIO-based interface for communications between the MicroVAX host and the KMV1A Controller, and memory mapped control of the host area for DMA data transfer to and from the KMV1A Controller. KMV1A MicroVAX Driver also allows full duplex data transmission between the host and the KMV1A Controller at up to 64K bps and host error-logging of detected KMV1A errors.

KMV1A MicroVAX Driver and Development Tools

SPD: 28.26
UPI: VCR

KMV1A MicroVAX Driver and Development Tools consists of two components: a driver to control communication between a MicroVAX host and a KMV1A Programmable Communications Controller, and development tools to facilitate the programming of the KMV1A Controller for custom telecommunications applications.

The driver provides a mechanism for communication between a MicroVAX host and the KMV1A Programmable Communications Controller. It controls communication by providing an interface between MicroVAX application programs and microcode being executed in the KMV1A Controller's microprocessor. The communication includes data transfer and the transfer of command, control, and status information to and from the KMV1A Controller. The driver also provides the mechanism to load microcode from the MicroVMS host into the KMV1A Controller and to initialize the microcode.

The driver consists of three components: the KMV1A driver, the installation verification program, and a demonstration program.

The development tools provide utilities for developing telecommunications microcode for a KMV1A Programmable Communications Controller installed on a MicroVAX II host. The microcode developed with the utilities is executed in the microprocessor of the KMV1A Controller to provide a layered telecommunications protocol application on the host system. The utilities include a generation procedure to assemble and link the user-written microcode, a debugger to permit the interactive debugging of the microcode, and a dump analyzer to provide a formatted printout of KMV1A and microcode data structures.

In addition to these utilities, the tools include a tools demonstration program and an installation verification program. The tools demonstration program includes KMV1A microcode and host-based software. The demonstration microcode provides an example of an effective microcode interface. The host-based portion of the demonstration program provides an example of application software that communicates with the demonstration microcode in the KMV1A Controller through the KMV1A driver. The installation verification program validates that the tools have been installed properly on the host system.

KMV1A MicroVAX Driver and X.25 Link Level Software

SPD: 28.27
UPI: VCQ

KMV1A MicroVAX Driver and X.25 Link Level Software consists of a driver to control communication between a MicroVAX host and a KMV1A Programmable Communications Controller; and KMV1A microcode and host-based software, which allow the KMV1A Controller either to process the data link level of the X.25 communications protocol or to perform HDLC framing.

The driver controls communication by providing an interface between MicroVAX application programs and microcode being executed in the KMV1A Controller's microprocessor. The communication includes data transfer and the transfer of command, control, and status information to and from the KMV1A Controller. The driver also loads microcode from the MicroVAX host into the KMV1A Controller and initializes the microcode.

The driver consists of three major components: the KMV1A driver, the installation verification program, and a demonstration program.

The X.25 link level component provides X.25-based communications capability and includes microcode, which is down-line loaded into the memory of the KMV1A Controller. The microcode is executed by the KMV1A Controller's microprocessor to control and process data transmission between the driver and the KMV1A Controller's communication line. The microcode can be configured at the user's option to execute the data link level of the X.25 communications protocol or to provide an HDLC framing capability.

The link level option provided by the microcode performs processing of the data link level of the X.25 protocol in conformance with the 1980 CCITT X.25 Recommendation pertaining to Link Access Procedure. Functions provided through the link level processing include data framing, frame header generation, error checking, and retransmission of erroneous frames.

The HDLC framing option provides a subset of the link level processing capability. Framing is done in conformance with the ISO 3309 Standard for HDLC frame generation and recognition.

The X.25 link level component also includes a sample host program, a tracing utility, and an installation verification program.

KMV1A VMS RMJ Link Level Software

SPD: 30.88
UPI: VW9

KMV1A VMS RMJ Link Level Software consists of KMV1A microcode that allows the KMV1A Controller to process the data link level of the RMJ communications protocol. This KMV1A firmware operates with the KMV1A MicroVAX Driver, which must be installed before the KMV1A VMS RMJ Link Level Software can be operated.

RMJ Link Level Software provides an RMJ communications capability to the KMV1A Programmable Communications Controller. RMJ Link Level Software is microcode that is downline loaded into the memory of the KMV1A Controller. The microcode is executed by the KMV1A Controller's microprocessor to control and process data transmission between the driver and the KMV1A Controller's communication line.

The RMJ link level protocol operated by the microcode performs processing of the data link level of the RMJ protocol in conformance with the 1986, RMJ Securities Corporation, Specification for the Digital Switching Service. The functions provided through the link level processing include data framing, frame header recognition, error checking, and transmission of acknowledgments for correctly received frames and transmission of negative acknowledgments for incorrectly received frames.

The microcode included in the RMJ Link Level Software product is downline loaded into the memory of the KMV1A Controller by the driver. When executed by the controller's microprocessor, the microcode provides three major functions: communication with the MicroVAX host via the driver, execution of the data link level of the RMJ protocol, and communication with the KMV1A Controller's serial communication line.

LCG01 Software

SPD: 30.46
UPI: VJ4

LCG01 Software is a downline loadable file used with the LCG01 Color Printing System. It is loaded into the LCG01 by any standard EIA-232, 20ma, or EIA-422 serial port supporting XON/XOFF protocol. Once the software is loaded, the LCG01 can process serial protocols including ASCII text, ReGIS (Remote Graphics Instruction Set), GIDIS (General Image Display Instruction Set), NAPLPS (North American Presentation Level Protocol Syntax), and color sixel.

All valid commands in these protocols are accepted. Only those commands applicable to a hardcopy, noninteractive device are acted upon.

Files can be transferred to the LCG01 using the standard system PRINT utility and the system print queues.

MicroVMS/DRQ3B Device Driver

SPD: 29.25
UPI: 0AP

MicroVMS/DRQ3B Device Driver (HXDRIVER) supports the DRQ3B interface, which is a general purpose 16 bit parallel interface between the MicroVAX Q-bus and a user's peripheral. The DRQ3B, under driver control, is capable of performing double buffered direct memory access (DMA) using the block mode capabilities of the Q-bus to provide high bandwidth data transfers. The DRQ3B interface also has 512 word FIFO (First In, First Out) buffers on both the input and output ports to allow data to be transferred while an interrupt service routine is setting up the next buffer.

MUXserver 300 Remote Terminal Server for ULTRIX

SPD: 25.F1
UPI: VZH

MUXserver 300 Remote Terminal Server for ULTRIX is a wide area terminal switch for Ethernet Local Area Networks. It has been designed to support interactive asynchronous terminal users, using data compression, background priority, and statistical multiplexing to optimize the network performance.

In general, the MUXserver/DECmux 300 provides the same terminal services to a remote workgroup as the DECserver products give to local users.

A MUXserver/DECmux 300 network provides a convenient method to connect workgroups of remotely located asynchronous terminals, printers, and computers to each other and to one or more service nodes (hosts) on an Ethernet.

MUXserver 300 Remote Terminal Server for VMS

SPD: 25.E9
UPI: VT7

MUXserver 300 Remote Terminal Server for VMS is a wide area terminal switch for Ethernet Local Area Networks. It has been designed to support interactive asynchronous terminal users, using data compression, background priority, and statistical multiplexing to optimize the network performance.

In general, the MUXserver/DECmux 300 provides the same terminal services to a remote workgroup as the DECserver products give to local users.

A MUXserver/DECmux 300 network provides a convenient method to connect workgroups of remotely located asynchronous terminals, printers, and computers to each other and to one or more service nodes (hosts) on an Ethernet.

MUXserver 320/380 Remote Terminal Server

SPD: 32.94
UPI: YWL

MUXserver 320/380 Remote Terminal Server is a wide area terminal switch for Ethernet Local Area Networks. It has been designed to support interactive asynchronous terminal users, using data compression, background priority, and statistical multiplexing to optimize the network performance.

When used in conjunction with a DECmux 300, the MUXserver 320/380 provides concurrent Local Area Transport (LAT) and INTERNET (Telnet/TCP /IP) support to enable connectivity to host systems that utilize LAT or INTERNET protocols. The INTERNET protocol suite is used to connect to UNIX host systems and other host systems that support the INTERNET protocol suite. In general, the MUXserver 320/380/DECmux 300 provides the same terminal services to a remote workgroup as the DECserver products give to local users.

PBXserver

SPD: 29.23
UPI: VCC

PBXserver is an Ethernet-based terminal server. It links to Digital PBXs through a European-standard 30-channel interface and allows terminals connected to a terminal adapter/telephone set to use VMS host services on Ethernet through the PBX and its associated building wiring.

The interface between PBXserver and the PBX runs at 2.048M bps. It is called ECMA S2 interface, based on the ISDN primary rate interface, 30B+D, and carries 30 data communications simultaneously. It is fully described by a set of ECMA standards, based on the CCITT recommendation for ISDN.

The terminal user has to establish a connection to PBXserver by dialing in through the terminal adapter/telephone set and the PBX. Once connected to PBXserver, the user has the same general functionality as a user of the DECserver terminal servers. The dial-in procedure is PBX-specific.

The reason for using a PBX for terminal access to services on Ethernet is to have a higher number of potential users than actual users: a concentration factor of between 5:1 and 3:1 is reasonable for an office environment.

The PBXserver software is down-line loaded into PBXserver hardware from a VAX host system running DECnet-VAX. Users may then access Ethernet-based MicroVAX VMS host services through LAT protocol.

User interfaces are provided to the terminal user and to the privileged user (system manager). PBXserver supports the simultaneous operation of up to 30 asynchronous terminals, including keyboard send-receive (KSR-) printers and PCs.

Features include XON/XOFF flow control between the terminal and PBXserver that can be dynamically enabled or disabled; switching to different host services from the LOCAL prompt of PBXserver without having to redial the connection through the PBX; access control by group codes, limiting accessibility of certain hosts to terminals; and direct inward dialing through the PBX for fast connection to a host service.

VAX DECscan VMS and ELN Bitbus Drivers

SPD: 27.98
UPI: VCJ

VAX DECscan VMS and ELN Bitbus Drivers provides a hardware and software link between the Q-bus series of MicroVAX processors and the Intel Bitbus. It allows for communication between users in a MicroVAX host and multidropped devices and software tasks running on those devices (nodes) adhering to Bitbus protocol. This product set consists of a MicroVAX VMS driver, a VAXELN driver, and an 8044 cross assembler and support utilities.

(Continued)

VAX DECscan VMS and ELN Bitbus Drivers *(Continued)*

The MicroVAX VMS driver, along with a user interface program, allows the user to access a Bitbus system through a program or interactively with the MicroVMS operating system. The user interface lets the user configure the system and test its responses for calibration purposes. VAX DECscan allows the user to obtain and monitor realtime data.

The VAXELN driver allows the user to build finished VAXELN systems on VMS or MicroVMS host systems, using the VAXELN toolkit. The finished VAXELN system is then downloaded to MicroVAX target systems, where it runs without the presence of another operating system. VAXELN is especially suited to creating realtime applications. The ELN target systems can be diskless and downloaded via Ethernet using DECnet services and protocols or permanently resident in the ELN target systems using EPROMs (erasable, programmable, read-only memories).

The 8044 cross assembler and support utilities allows the user to develop application tasks on the VMS host system, to run on 8044-based Bitbus nodes. When using the DECscan MicroVMS driver, these remote node tasks are downloaded directly to and run on the Bitbus nodes. When using the DECscan ELN driver, these remote tasks are included in the finished VAXELN system that is downloaded to the MicroVAX target system. The finished VAXELN system then downloads the remote Bitbus tasks to run on the Bitbus nodes.

VAX DT07

SPD: 25.88
UPI: S32

VAX DT07 software allows the VMS operating system user to electronically connect the switchable UNIBUS, together with all attached peripherals, to the user's system. When the DT07 is connected, the switched peripherals operate as if they were permanently attached to that system. When the DT07 is disconnected, the switched peripherals are removed and are then available for connection to another system. Up to four systems can share a single switched UNIBUS via the DT07.

VAX DT07 consists of two separate parts: a Driver and a Bus Switch Manager. The Driver maintains control of the DT07, monitors its activities, supports the connect and disconnect functions, and handles associated system-level housekeeping tasks for each processor. The Bus Switch Manager provides a link between the user and the DT07 Driver. The Bus Switch Manager also maintains information regarding users that are currently using the switched UNIBUS and the status of operations performed in controlling the switched UNIBUS.

VAX Genius Driver

SPD: 25.J9
UPI: VUR

VAX Genius Driver supports the IGQ11 interface, which provides a hardware link between the MicroVAX Q-bus and the GE-Fanuc Genius I/O bus. The IGQ11, under driver control, is capable of communicating, through a dual ported memory, to GE-Fanuc Genius I/O connected to the IGQ11. All communication with the IGQ11 interface (IGQ11-xx) is through driver calls. VAX Genius Driver provides the standard operating system QIO interface to the IGQ11-xx.

VAX KCT32

SPD: 26.04
UPI: 128

VAX KCT32 is a software and firmware package that provides VMS support for the KCT32 hardware communication option. It allows users to implement custom communication applications. Users can program the KCT32 communication lines for bit/byte synchronous or asynchronous transmission and reception using the standard Digital PDP-11 Instruction Set. When used with the KCT32 hardware and user-written communication application, VAX KCT32 allows the VMS host processor to perform high-speed, multiline communication functions.

Software features include the VMS general-purpose driver; downline loading of the KCT32 user-developed communication; KCT32 status and statistics; full duplex driver operation; UETP (User Environment Test Program); IVP (Installation Verification Program); and integrated support of the UETP, IVP, and level 2R diagnostic in the VMS driver. The driver is full duplex, maintains internal queues, and supports up to four KCT32's concurrently.

The KCT32 firmware consists of system support modules upon which users can build and debug custom communication applications. The support modules consist of the KCT32 executive; modem control, baud rate generator, and CSR interfaces; timer functions; KCT32 front-end I/O processor interface; KCT32 ODT type debugger interface; DMA interfaces; and onboard selectable interface for EIA-422/449, EIA-423, and EIA-232.

VAX KMS11-BD/BE HDLC/BSC Framing Software

SPD: 26.55
UPI: 920

VAX KMS11-BD/BE HDLC/BSC Framing Software consists of a VMS software driver and firmware for the KMS11-BD/BE, which allow VMS users to build and implement custom or standard communication protocol without having to program the KMS11-BD/BE.

The KMS11-BD/BE firmware provides the HDLC or BISYNCH (BSC) framing of the data, as well as the DMA between the KMS11-BD/BE and VAX host. This capability reduces the host of processor overhead associated with character interrupt devices. The host is no longer interrupted on each character that is transmitted or received and does not have the software overhead associated with determining what to do with each character as it is received or transmitted. Rather, an interrupt is generated on a message transmitted or received basis, and processing then takes place on the entire message.

The driver is the interface that allows the user to transmit or receive command, control, or message data between VMS users, the KMS11-BD/BE firmware, and the remote end of the communication line. The software driver for the KMS11-BD/BE provides the interface that allows the VMS user to send or receive messages for various protocols in the VMS host. Those messages are then sent or received via DMA from KMS11-BD/BE HDLC/BISYNCH Framing Software.

The purpose of the KMS11-BD/BE firmware is to provide the basic HDLC or BISYNCH line framing of the messages received or to be transmitted from the VAX host using a DMA device. It is the responsibility of a host application program (not supplied with this software) to provide the protocol line control. This program can be written in a higher level language that is supported on VMS systems.

VAX KMS11-BD/BE X.25 Link Level Software

SPD: 25.80
UPI: 757

VAX KMS11-BD/BE X.25 Link Level Software is a package of X.25 Level 2 firmware plus a VMS device driver for the KMS11-BD/BE X.25 Link Level Software. The driver, in conjunction with the X.25 Level 2 firmware and KMS11-BD/BE hardware, allows the VAX VMS processor to perform high-speed, multiline synchronous communication in a point-to point environment.

(Continued)

VAX KMS11-BD/BE X.25 Link Level Software *(Continued)*

The primary purpose of the driver is to allow command, control, and data information to be communicated between VMS users, KMS11-BD/BE firmware, and the remote end of a communication line.

VAX LN03 Image Support Software

SPD: 31.52
UPI: GXZ

VAX LN03 Image Support Software consists of a VMS device driver for the LN03 Image printer and associated MD300 scanner. The software also includes a PostScript library used exclusively by VAX ScriptPrinter Software.

Calls are made to the PostScript library from VAX ScriptPrinter Software to convert PostScript data into bit-mapped data capable of being printed by the LN03 Image printer.

VAX PCL

SPD: 26.23
UPI: S33

VAX PCL is an optional software product that supports interprocessor communications through the PCL11 hardware option. The VAX PCL driver provides a message-oriented data communications capability between user software located in up to 16 processors linked into a local area network by the PCL11 multidropped parallel bus. A user-oriented message of variable length can be directed to any single receiving node during each transmission transaction. Both VAX and PDP-11 processors can be combined on the same PCL11 local network. The VAX PCL driver is compatible with the PCL-11M driver for the RSX-11M operating system.

The VAX PCL driver also supports interprocessor communications through the DECnet-VAX network software package. The PCL11 hardware and VAX PCL driver supports the features of DECnet-VAX except down-line loading. Mixed networks of VAX and RSX-11M DECnet nodes can be implemented.

VAX PCL is provided as source code only.

VAX ScriptPrinter Software

SPD: 27.84
UPI: VF9

VAX ScriptPrinter Software is a layered product required by suitably configured VMS systems to access the ScriptPrinter (LN03R) and the LN03 Image Laser Printer (LN03Q). VAX ScriptPrinter Software consists of a print symbiont that processes print requests from the host on which it resides; translators that convert ANSI text and sixel graphics, ReGIS, Tektronix 4010/4014, and DDIF bitonal image files into the PostScript language; and a series of PostScript tools for creator software support. ScriptPrinters connected to a DECserver must have the ScriptPrinter software installed on each system that will provide distributed print services to its users.

Print symbiont command parameters include data type, messages, lay-up definition, number up, page limit, page orientation, page size, sheet size, and sheet count. The /SETUP qualifier sends specified modules from a device control library to the printer. These modules can be encoded in either ANSI or PostScript.

The print symbiont also supplies accounting information for each print job, including sheets of paper printed, the number of RMS that get to the user's files in the print job, and the number of QIO writes over the network to the print server.

Translator software allows users to print documents on the ScriptPrinter or LN03 Image Laser Printer with graphic protocols other than the native language of the printer by translating the designated protocol into PostScript. At print time, the translators are invoked by the print symbiont through the /PARAMETERS switch of the PRINT command or by submission to a translator-specific queue.

The translators provided convert ANSI text and sixel graphics compatible with the LN03 into PostScript. PostScript tools include a PostScript error handler, which prints the last partial page of output as well as information to help identify the error.

VAX TU70/72 Device Driver

SPD: 27.09
UPI: 187

VAX TU70/72 Device Driver is an integration product that allows the use of TU70 or TU72 tape transports in an environment consisting of VAX, DECsystem-10, and DECSYSTEM-20 systems. The driver forms an interface between the VMS operating system and the tape subsystem that allows users to access these tape transports as they would any other VMS tape device. The driver performs hardware-specific functions for tape positioning, tape read/write, user mode diagnostic support, and error logging.

Features include tape positioning and read and write functions compatible with other VMS tape equipment; full support for VMS utility programs such as BACKUP and COPY; hardware error reporting through the ERF program; automatic load of DX20 microcode at startup and provision for operator-initiated reload; and assistance in managing a dual-ported configuration through a special operator program.

VAX Wide Area Network Device Drivers

SPD: 29.64
UPI: VAW

VAX Wide Area Network Device Drivers contains the VMS device drivers for Digital's synchronous communications options. VAX Wide Area Network Device Drivers includes device drivers that are reserved for use by Digital software products and device drivers that offer a supported user interface. The device drivers support full duplex and half duplex operation. DDCMP and SDLC device drivers support point-to-point and multipoint tributary operation.

The maximum permitted line speed is dependent on the line interface standard used and must not exceed 19.2K bps for an RS232/V.24 standard interface. There may be additional line speed restrictions for other line interface standards. Data throughput over the synchronous lines is dependent on user applications and the system environment. The device drivers support modem control signal operation.

VAXELN Ethernet Driver/Switch

SPD: 28.31

VAXELN Ethernet Driver/Switch is a VAXELN Driver program that supports VAXELN application software programs that require access to a DEQNA data communications controller. The program supports two Ethernet Local Area Networks (LANs) connected to a MicroVAX II running VAXELN Toolkit.

(Continued)

VAXELN Ethernet Driver/Switch *(Continued)*

The VAXELN Ethernet Driver/Switch software supports one active DEQNA data communications controller at a time. The major features or functions provided by the program include user commands when Ethernet Local Area Network (LAN) is active, and transmission and reception of network data messages across the Ethernet switch. Controller switching operations are transparent to higher network protocol (DECnet) layers.

VAXELN KMV1A Support Software Package

SPD: 28.35
UPI: Z71

VAXELN KMV1A Support Software Package consists of a VAXELN KMV1A driver program and a VAXELN KMV1A high-level language interface library that facilitates the development of MicroVAX applications that utilize microprogrammed KMV1A product-supported radar and communications protocols. KMV1A Support Software Package supports EPascal application programs.

Driver and library support includes loading KMV1A microprograms from mass storage into KMV11 memory, starting and stopping KMV1A microprogrammed execution, realtime response to KMV1A microprogrammed events, simultaneous support for up to 16 KMV1A devices, KMV1A list/buffer definition and creation, and an online message error facility for status code translation.

VAXELN KMV1A Tool Kit

SPD: 29.17
UPI: 0JP

VAXELN KMV1A Tool Kit allows the development of KMV1A control programs for KMV1As in MicroVAX VAXELN systems. This package includes software that creates KMV1A control program images on a VAX host system, VAXELN KMV1A Load and Dump Programs, and a KMV1A network Debug package that allows the testing and debugging of KMV1A control programs from a VAX host system. VAXELN KMV1A Tool Kit is designed to operate with the VAXELN Toolkit and the VMS RSX Emulation products. This product features automated KMV1A control program image generation, a KMV1A Load Program, a KMV1A Dump Program, and remote debugging.

The KMV1A Load Program includes loading KMV1A control programs from local or network mass storage, loading the KMV1A Debugger into KMV1A, and using a Master Clear KMV1A option.

KMV1A Dump Program includes application program commands for stopping and dumping of KMV1A for realtime snapshot of KMV1A state, dumped material stored in local or network mass storage, and dumped material examined with the standard VMS Dump/Analyze Program.

Remote Debugging includes network debugging. The host VAX system must have Ethernet connection to a MicroVAX with KMV1A installed. The debug strategy follows the VAXELN Network Debug model. An operator interface program executes on the VAX host system. VAXELN Debug Server Program operates a communications channel through the MicroVAX in which KMV1A is installed. The Debug Server connects the operator interface on the Ethernetted VAX system through Ethernetted MicroVAX to KMV1A. The KMV1A Debug Service module executes in KMV1A to provide ODT-type debugging. This Debug Service module can be linked into a KMV1A control program or loaded into KMV1A independently.

VS11-VAX Driver

SPD: 25.45
UPI: S28

VS11-VAX Driver provides all *the I/O* services required for communication between a VAX host and a VS11 graphics subsystem. VS11-VAX Driver enables the user to communicate with the VS11 using the QIO executive directive in a MACRO assembly language program or a VAX FORTRAN program.

Features include execution of a display file containing VS11-specific graphics instructions; on-demand use of an auxiliary memory segment that contains VS11 instructions, providing extended addressing to the VS11; reading back of the four VS11 device registers; execution of STOP/RESUME display file; waiting for an interrupt that will be generated when the VS11 joystick switch is pressed; and specifying the QIO complete time-out parameter for display file execution QIOs.

X25portal 2000

SPD: 25.F9
UPI: VHU

X25portal 2000 provides the facilities necessary to implement an X.25-based connection-oriented network service across a DECnet backbone network and provides packet switching exchange facilities over this network. The system allows local switching of X.25 SVCs inside the system; has DTE to X25portal 2000 node address resolution, which makes use of the VAX Distributed Name Service (DNS); provides virtual circuit accounting; traces protocol messages sent or received by the X25portal 2000; logs events to any designated VMS sink node; and acts as a DECnet Phase IV end-node.

The system is a combination of the DEC MicroServer (DEMSA) communications server and software. Major features of the complete system are synchronous line capabilities; X.25 capabilities; network and configuration management capabilities; accounting features; security features; network and configuration management, using the DECnet Network Control Program (NCP) from any DECnet IV node; and support of a wide range of optional X.25 facilities.

X25Router 2000

SPD: 28.86
UPI: VIA

X25Router 2000 is a communications product that provides routing and X.25 communications services for a Local Area Network (LAN). It allows communications with nodes outside the LAN within a Wide Area Network (WAN). By using X25router 2000, the routing load on other nodes on the LAN is reduced, releasing resources for other applications.

CADRA-VIEW for VMS

SPD: 33.88
UPI: GFY
GG1 (View only)
GG3 (DXF interface)
GG5 (ADT interface)
GG7 (IGES)
GLW (Translators)

CADRA-VIEW for VMS is a software product which provides the capability of sharing CADRA-III drawings with other individuals in the organization. It provides a low-cost solution for view-only and red-lining requirements in support of concurrent engineering environments without altering the master drawing file. It provides query capabilities regarding geometric properties and supports industry standard interfaces such as DXF, IGES and Raster files. In addition, it supports HPGL and PostScript output including red-lining additions.

CDD/Administrator for VMS

SPD: 32.72
UPI: YP8

CDD/Administrator for VMS is a DECwindows Motif based, fully customizable, graphical management tool for CDD/Repository. It allows persons who manage or administer repositories to locate, query, manipulate, manage, and report on objects stored in CDD/Repository through a graphical interface.

DEC GKS-3D for ULTRIX

SPD: 30.93
UPI: VX3 (VAX development)
VX4 (VAX runtime)
VX1 (RISC development)
VX2 (RISC runtime)

DEC GKS-3D for ULTRIX (Graphical Kernel System for Three Dimensions) provides the application programmer with a set of functions for interactive and non-interactive computer graphics applications that define and display computer generated three dimensional pictures using a variety of computer graphics equipment. DEC GKS-3D, as a development tool, is a solid base for portable, device-independent, three dimensional graphics application development.

DEC GKS-3D is a subroutine library packaged as a linkable object library for ULTRIX.

DEC GKS-3D implements the International Standard ISO (ISO 8805) Graphical Kernel System for Three Dimensional device-independent graphics. DEC GKS 3D conforms to level 2c of the GKS-3D International Standard. Thus, it provides full output capabilities including workstation independent segment storage (level 2) and full input capabilities, synchronous and asynchronous input (level c).

DEC GKS-3D is upward compatible with Digital Equipment Corporation's DEC GKS (two dimensional Graphical Kernel System) in the limit of the GKS 3D standard required upwards compatibility with the GKS standard. Two dimensional GKS graphics applications, written to conform to the ISO standard, will run without change using DEC GKS-3D.

DEC GKS-3D allows the user to specify views of 3D objects and define the working coordinate system (world coordinates). World coordinates can have any scale. For example, one application might have a maximum range from 0 to 1000.0 while another application might limit the range from 0.01 to 0.1.

The user can control multiple simultaneous views of the same object on separate display surfaces, as well as the position of the picture on the surface. For example, one application program can display on a workstation an image of a cube in one window, and at the same time in another window (on another workstation if required), display a detail of the rear of the cube.

DEC GKS-3D for VMS

SPD: 25.D2
UPI: VFX (Development)
VFY (Runtime)

DEC GKS-3D for VMS provides the application programmer with a set of functions for interactive and non-interactive computer graphics applications that need to define and display computer generated three-dimensional pictures using a variety of computer graphic equipment. DEC GKS-3D as a development tool is a solid base for portable, device independent, three-dimensional graphics application development.

DEC GKS-3D (Graphical Kernel System for Three Dimensions) is a subroutine library packaged as a VMS Run Time Library with shareable image device handlers.

DEC GKS-3D implements the International Standard (IS 8805) Graphical Kernel System for three-dimensional device-independent graphics. DEC GKS 3D conforms to level 2c of the GKS-3D International Standard. Thus it provides full output capabilities, including workstation independent segment storage (level 2), and full input capabilities (synchronous and asynchronous input (level K)).

DEC GKS-3D is upwardly compatible with Digital Equipment Corporation's DEC GKS (two-dimensional Graphical Kernel System). Two-dimensional graphics applications, written to conform to the ISO standard, will run without change using DEC GKS-3D.

DEC GKS-3D allows the user to specify views of 3D objects and define the working coordinate system (world coordinates). World coordinates can have any scale. For example, one application might have a maximum range from 0 to 1000.0 while another application might limit the range from 0.01 to 0.1.

The user can also control multiple simultaneous views of the same object on separate display surfaces, as well as the position of the picture on the surface. For example, one application program can display an image of a cube in one window on a workstation and at the same time in another window (on another workstation if required) it can display a detail of the rear of the cube all from the same application program.

DEC GKS-3D provides an interface to sequential files, the ISO suggested GKS-3D Metafile for filing graphical information. The Metafile can be used for the following purposes; transporting graphical information between systems with compatible versions of GKS-3D, transporting graphical information from one DEC GKS-3D application to another, and storing accompanying non-graphical information.

DEC GKS-3D provides support for storing two-dimensional views of three-dimensional objects encoded in Digital's Document Interchange Format (DDIF). Views stored in DDIF may be then processed by applications which conform to Digital's Compound Document Architecture.

DEC GKS-3D provides support for VMS DECwindows.

DEC GKS-3D provides an escape mechanism which allows the application programmer to access device capabilities not defined in the GKS standard.

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DEC GKS-3D for VMS *(Continued)*

In DEC GKS-3D, text lies on a plane which may be arbitrarily positioned in 3D space.

DEC GKS-3D provides support for a wide variety of Digital and non-Digital graphics output devices and support for Digital VAXstations as input and output devices.

DEC GKS-3D provides control functions for managing the manner and devices on which pictures will be displayed. These include GKS-3D initialization and termination, and functions that control the opening and closing of logical graphical devices. It also provides a complete set of inquiry functions which aid in developing modular, device-independent programs.

The DEC GKS-3D Run-Time license does not allow the user to create new applications, but rather allows execution of applications that were previously developed using the full DEC GKS-3D Developer's Kit.

DEC GKS for VMS

SPD: 26.20
UPI: 810 (Development)
811 (Runtime)

DEC GKS for VMS provides the application programmer with a single interface to a variety of graphic devices. DEC GKS for VMS is a development tool that application programmers can use to produce computer generated pictures. DEC GKS for VMS is a solid base for portable, device independent two-dimensional graphics application development.

DEC GKS for VMS is a subroutine library packaged as a set of VMS shareable images, which implements the ISO (ISO 7942) and ANSI (ANSI X3.124-1985) GKS standard for two-dimensional (2D) device-independent graphics. DEC GKS for VMS conforms to level 2c of the GKS standard which provides full output capabilities, including workstation independent segment storage (level 2), and full input capabilities (synchronous and asynchronous input (level c). DEC GKS for VMS supports DECwindows.

DEC Image Utility Library for VMS

SPD: 34.47
UPI: GL9

DEC Image Utility Library for VMS (IUL) provides a basic set of application-callable subroutines for use in the transport and display of CCITT compressed bitonal images between an X client and X server. The IUL subroutines are an application-programmer interface to an X Image Extension (XIE) server. XIE has been proposed to the MIT X consortium as an image extension to the X protocol.

DEC IUL is intended to be used as embedded subroutines within applications constructed to include control of the display of images on video devices that are compliant with the proposed XIE standard.

The DEC IUL capabilities supply an application interface with an underlying implementation that extends the XLIB facilities of the host system with an extension of library facilities called XIELIB. In addition, IUL provides routines that aid in the integration of image applications with the host system environments.

DEC PHIGS for ULTRIX

SPD: 25.K7
UPI: VW6 (Development)
VW7 (Runtime)

DEC PHIGS for ULTRIX (Programmers Hierarchical Interactive Graphics System) is a sophisticated 3D graphics support system that controls the definition, modification, and display of hierarchical graphics data. DEC PHIGS for ULTRIX manages the organization and display of graphical data stored in a conceptually centralized database.

DEC PHIGS for ULTRIX is Digital Equipment Corporation's implementation of the 1988 ANSI/ISO PHIGS standard for three dimensional (3D) device independent graphics. DEC PHIGS for ULTRIX provides the standard FORTRAN and C language bindings as well as a language-independent (PHIGS$) binding. DEC PHIGS for ULTRIX is supported on most Digital processors running the ULTRIX operating system.

DEC PHIGS for ULTRIX is device independent. That is, the same program can generate graphical output on different devices without modification to the source code. DEC PHIGS for ULTRIX supports DECwindows (UWS). DEC PHIGS for ULTRIX also supports most of the hardcopy devices supported by DEC GKS, such as the HPGL series of plotters and Digital's compatible sixel devices, as well as all the terminals supported by DEC GKS.

DEC PHIGS for ULTRIX is packaged as a linkable object library.

DEC PHIGS for VMS

SPD: 29.38
UPI: 0KB (Development)
VK1 (Runtime)

DEC PHIGS for VMS (Programmers Hierarchical Interactive Graphics System) for VMS is a sophisticated 3D graphics support system that controls the definition, modification, and display of hierarchical graphics data. DEC PHIGS for VMS manages the organization and display of graphical data stored in a conceptually centralized database.

DEC PHIGS for VMS is Digital Equipment Corporation's implementation of the 1988 ANSI/ISO PHIGS standard for three dimensional (3D) device independent graphics. DEC PHIGS for VMS provides the standard FORTRAN and C language bindings as well as a language-independent (PHIGS$) binding. DEC PHIGS for VMS is supported on most Digital processors running the VMS operating system.

DEC PHIGS for VMS is device independent. That is, the same program can generate graphical output on different devices without modification to the source code. DEC PHIGS for VMS supports either DECwindows or VMS Workstation Software (VWS). DEC PHIGS for VMS also supports most of the hardcopy devices supported by DEC GKS, such as the HPGL series of plotters and Digital's compatible sixel devices, as well as all the terminals supported by DEC GKS.

DEC PHIGS for VMS is a subroutine library packaged as a set of shareable images which the application program is linked against. The shareable images are activated at run-time as needed.

DEC VUIT (Visual User Interface Tool) for ULTRIX Systems

SPD: 33.78
UPI: GE8

DEC VUIT (Visual User Interface Tool) for ULTRIX Systems is an interactive WYSIWYG style (What-You-See-Is-What-You-Get) editor for building Motif application interfaces. It is intended for developers experienced in constructing interfaces using Motif or similar windowing systems.

DEC VUIT provides a direct manipulation interface to the OSF/Motif User Interface Language (UIL). DEC VUIT also provides an environment that supports rapid development of graphical user interfaces that are compliant with OSF/Motif. Prototype

(Continued)

DEC VUIT (Visual User Interface Tool) for ULTRIX Systems *(Continued)*

interfaces can be tested, quickly modified based on end-user input, and fed directly into the development stream. Since DEC VUIT generates industry-standard OSF/Motif UIL, not a proprietary presentation description language, the interface built using DEC VUIT is portable to any other platform that supports the OSF/Motif environment.

DEC VUIT enables developers to build the interface visually instead of writing code. During editing, it uses inherent knowledge of widget properties and parent-child relationships to reduce runtime errors.

DEC VUIT (Visual User Interface Tool) for VMS Systems

SPD: 32.09
UPI: YHC

DEC VUIT (Visual User Interface Tool) for VMS Systems is an interactive WYSIWYG style (What-You-See-Is-What-You-Get) editor for building Motif application interfaces. It is intended for developers experienced in constructing interfaces using Motif or similar windowing systems.

DEC VUIT provides a direct manipulation interface to the OSF/Motif User Interface Language (UIL). DEC VUIT also provides an environment that supports rapid development of graphical user interfaces that are compliant with OSF/Motif. Prototype interfaces can be tested, quickly modified based on end-user input, and fed directly into the development stream. Since DEC VUIT generates industry-standard OSF/Motif UIL, not a proprietary presentation description language, the interface built using DEC VUIT is portable to any other platform that supports the OSF/Motif environment.

DEC VUIT enables developers to build the interface visually instead of writing code. During editing, it uses inherent knowledge of widget properties and parent-child relationships to reduce runtime errors.

DECdesign

SPD: 29.29
UPI: XD1 (Platform)
XAK (Yourdon technique)
XAL (Gane & Sarson technique)
XAM (MERISE technique)

DECdesign is a DECwindows-based, VMS-layered product that graphically supports the analysis and design phase of the software development life cycle. Graphics-based analysis and design models describe the application under development the way blueprints describe a building under construction.

Software engineers using DECdesign can create, modify or reuse these models to describe a software system according to the rules of the modeling technique.

DECdesign supported modeling techniques are Yourdon Structured Design and Gane & Sarson for process modeling, Ward-Mellor extensions to Yourdon Structured Design for realtime application modeling and Extended Entity Relationship (EER) for data modeling.

On-line training and context sensitive help are included in DECdesign.

DECdesign is a multiple-user system that supports concurrent access, data security and permanent data storage.

DECdesign stores analysis and design models in libraries that have the following functions: security, data storage, data sharing, and design control.

The software designer can select from one of two technique libraries available in DECdesign to model their application; Yourdon (with Ward Mellor extensions)/EER or Gane & Sarson/EER. The models are defined and manipulated using graphic icons which represent the constructs of a chosen technique. DECdesign, upon the user's request, will check for valid models based upon predefined but differing rules for each technique. DECdesign does not support validation of Ward-Mellor State Transition Diagrams or State Tables. The process and data models are integrated in each of the two libraries through the sharing of data definitions.

DECimage Application Services for ULTRIX

SPD: 31.73
UPI: YF7

DECimage Application Services for ULTRIX is a programmer interface for basic image data type handling. It consists of library-resident routines for scanning, viewing, printing, and manipulating image data.

Application Services enables application developers and systems integrators to handle bitonal, gray scale (photographic), and RGB (red, green, blue) color image data as they develop applications that deal concurrently with image, text, and graphics. Routines provide C language bindings and include examples in C. The programmer productivity tools offer a consistent interface that conforms to MIT C bindings and routine names for source code transportability.

Application Services complies with CCITT, Group III (1D and 2D) and Group IV (2D) (CCITT Standards T.4 and T.6) recommendations for bitonal (facsimile) image data compression schemes; the X-Window standard; and the PostScript Language Reference industry standard.

This product features a condition handling facility (CHF) to provide error signaling that is portable between VMS and ULTRIX. CHF provides one common interface for both VMS and ULTRIX applications and includes message support services.

Features include Image Input Services, which allows programmers to control an image input device and to acquire the image data from that device. Image Services Library provides integrated image data type support and core services for bitonal and continuous tone images. Image Display Services provide rendition and presentation services for device independent image display for applications.

DECimage Application Services for VMS

SPD: 25.E8
UPI: 829

DECimage Application Services for VMS is a programmer interface for basic image data type handling. It consists of library-resident routines for scanning, viewing, printing, and manipulating image data.

Application Services is intended to enable application developers and systems integrators to handle bitonal, gray scale (photographic), and RGB (red, green, blue) color image data as they develop applications that deal concurrently with image, text, and graphics.

The routines are language-independent and include examples in BASIC, FORTRAN, and C. These programmer productivity tools offer a consistent interface that conforms to the VAX-11 Procedure Calling and Condition Handling Standard or MIT C bindings and routine names for source code transportability.

(Continued)

DECimage Application Services for VMS *(Continued)*

Application Services supports VMS DECwindows and complies with CCITT, Group III (1D and 2D) and Group IV (2D) (CCITT Standards T.4 and T.6) recommendations for bitonal (facsimile) image data compression schemes; the X Window System standard; and the PostScript language reference industry standard. It also complies with Digital's Imaging System Architecture (DISA), Document Interchange Format (DDIF), and Compound Document Architecture.

Application Services features a condition handling facility (CHF) to provide error signaling that is portable between VMS and ULTRIX. CHF provides one common interface for both VMS and ULTRIX applications and includes messaging support services.

DECimage Character Recognition Services for VMS

SPD: 34.24
UPI: GJF

DECimage Character Recognition Services for VMS is a set of runtime services for the recognition and conversion of text information contained in bitonal images. Images can be scanned documents or existing bitonal image files. It provides a language-independent programmable interface that is used in conjunction with DECimage Application Services to develop image applications that include character recognition. DECimage Character Recognition Services also provides the runtime environment for these applications.

DECimage Character Recognition Services supports a subset of the ISO LATIN 1 character set. It recognizes most common European languages and a broad range of fonts in a broad range of font sizes. It converts recognized text into ASCII, DDIF, or PostScript format. Converted text can be used by text-based editors, forms packages, indexing systems, and electronic mail.

DECimage Character Recognition Services can process an entire image for character recognition or specified regions of interest.

DECimage EXpress

SPD: 37.41
UPI: MBU (Runtime)
MBV (Development)
MBW (Client)
MBX (Server)

DECimage EXpress includes two components: DECimage EXpress (Client and Server) and DECimage EXpress Application Development Environment.

DECimage EXpress is a ready to use and functional document imaging system. This scaleable system is designed to operate as a combination of specified hardware and software components. The hardware portion includes VAX supported processors and client support for PCs and Workstations (refer to the System Support Addendum, SSA 37.41.00) and image capable Digital Equipment Corporation X-Terminals. Using this combination, DECimage EXpress delivers the ability to convert a paper based information system to an online, image based information system. Among the capabilities of DECimage EXpress are the basic document image management functions of capture, index, storage, retrieval, distribution, and system management.

In addition, DECimage EXpress Application Development Environment is the VAX C callable application programming interface that is used to extend the DECimage EXpress application system. This functionality is provided by a set of routines used by the DECimage EXpress System Administration, Data Storage, and Document Indexing subsystems to access documents within DECimage EXpress. This enables the user to tailor the end product to the specific situation at hand.

DECimage SCAN Software for ULTRIX

SPD: 31.75
UPI: YF8

DECimage SCAN Software for ULTRIX is an application for the capture of bitonal (black-and-white) images and the adjustment of bitonal, grayscale, and RGB color images read in from DDIF format image files. It scans, previews, adjusts images, and reads and creates DDIF image files. Files created using the DECimage SCAN Software can be used by other applications that operate on DDIF image files.

The Scanner Set-up feature allows users to select the scanner, contrast, brightness, resolution, page size, mode, scan framing, window set-up, and units of measurement for framing and window set-up. Preview Image displays the image scaled to fit into the preview window or magnified to display each pixel of the scanned image. Edit functions include CROP, WASH, REVERSE, ROTATE, and UNDO. File functions include SAVE AS, OPEN AS, and CLIPBOARD. Customizing functions allow users to retain settings that customize the operation of DECimage SCAN.

DECimage SCAN Software for VMS

SPD: 25.D4
UPI: YPF

DECimage SCAN Software for VMS is a DECwindows application for the capture and adjustment of bitonal (black and white) images using the MD300 Scanner and the adjustment of bitonal, gray scale, and RGB color images read in from DDIF (Digital's Document Interchange Format) format image files. Capabilities include scan, preview, adjustment of images, reading and creating DDIF image files, and mailing image files. Files created using the SCAN Software can be used by other applications that operate on image files in DDIF.

DECimage Storage Manager for VMS

SPD: 31.22
UPI: 893 (Server)
YGD (Client)

DECimage Storage Manager for VMS is the storage component of the DECimage product set. This component provides centralized storage and distributed access of image data. The DECimage Storage Manager uses a client/server approach, in which the server software provides centralized storage capability and the client software provides distributed access to the image data.

The server provides control of image access and client privileges on the server, control of storage resources, transparent access to the image data, and shutdown and restart capabilities.

The client software establishes and terminates sessions with a server node; controls the physical location and access to image objects; provides services to create new storage sets, attach to existing storage sets, delete a storage set, and list the available storage sets on a server node; and provides the ability to manipulate access control lists. The client software also provides functions to create, retrieve, and delete image objects, as well as to set and retrieve image attributes; and supports the movement of images between storage devices.

DECimage Storage Manager is intended to be used with a database product. It provides a unique key for each image object stored. This image key can be placed in a database to associate application information with the stored image data. When an application wants to retrieve the image, it retrieves the image key from the database, then returns the image key to the client software.

DECmpp Image Processing Library

SPD: 36.69
UPI: XT5 (License and documentation)
XT4 (Media)

DECmpp Image Processing Library is an optimized set of image processing routines for the DECmpp 12000 Series systems. The library supports the development of high performance image processing solutions on a fully programmable platform with a symbolic, window-based, interactive, graphical, and network-distributed development environment. Library routines are directly callable from DECmpp Programming Language (DPL). The DPL routines are callable from C or FORTRAN. The library includes routines for image arithmetic, low-level image processing operations, and image analysis, as well as a variety of utilities for image display, I/O, test image generation, and format conversion.

The Image Processing Library routines are written in DECmpp Programming Language and have been tuned for optimal performance. The library uses an internal virtualization strategy (mapping of data elements to processors) that provides for configuration independence across the entire range of DECmpp 12000 Series systems.

A consistent and well-defined calling interface and set of virtualization primitives allows users to extend the library by adding new routines. Additionally, this consistent interface provides a foundation for developing interactive image analysis systems based on the library's primitives.

Basic routines operate in a memory-to-memory fashion, with various utilities provided to move images to and from the file system. This allows developers to string together image operational pipelines that work entirely in memory, avoiding I/O overhead typically associated with image processing software systems that use a disk-to-disk model.

DECpresent for ULTRIX

SPD: 32.08
UPI: YHG

DECpresent for ULTRIX is an application which enables users to prepare presentation materials quickly and easily. DECpresent provides a complete set of features to automate and accelerate the task of preparing and delivering a presentation using overhead transparencies, 35mm slides, or the workstation display.

Presentation content or "slide shows" may be comprised of text, graphics, images, charts and tables.

DECpresent offers an integrated outliner, table editor, text editor, graphics editor, and color image editor. DECpresent includes DECchart for data driven charting. DECpresent is a full-color application.

DECpresent includes productivity features for the creator of a presentation. The Sorter View allows the user to view the presentation as a group of slides displayed in a reduced scale. Using the Sorter View, it is easy to re-order the slides within a presentation and easy to perform common edits such as copy, delete, etc. Speaker Notes permits the user to create and print a companion set of notes.

To help the user illustrate presentations, DECpresent includes an Art Gallery. Users can visually preview, then select the artwork from the art gallery directly into the presentation.

A Slide Show facility is provided which enables the workstation display to act as the presentation delivery media.

DECpresent includes an Equation Editor for technical and scientific presentations.

DECpresent runs under ULTRIX DECwindows (included with ULTRIX Operating System) and utilizes a graphical WYSIWYG (What-You-See-Is-What-You-Get) interface. The WYSIWYG interface displays the document on the screen closely simulating how it will appear when printed.

DECpresent adheres to the DECwindows Style Guide and has the same look and feel as other DECwindows applications.

DECpresent is compliant with Digital's Compound Document Architecture (CDA), and can take advantage of the CDA converter architecture and system level support.

DECpresent for VMS

SPD: 32.07
UPI: YHE

DECpresent for VMS is an application that enables users prepare presentation materials quickly and easily. DECpresent provides a complete set of features designed to automate and accelerate the task of preparing and delivering a presentation using overhead transparencies, 35mm slides, or the workstation display.

Presentation content or "slide shows" may be comprised of text, graphics, images, charts and tables.

DECpresent offers an integrated outliner, table editor, text editor, graphics editor, and color image editor. DECpresent includes DECchart for data driven charting. DECpresent is a full-color application.

DECpresent includes productivity features for the creator of a presentation. The Sorter View allows the user to view the presentation as a group of slides displayed in a reduced scale. Using the Sorter View, it is easy to re-order the slides within a presentation and to perform common edits such as copy, delete, etc. Speaker Notes permit the user to create and print a companion set of notes.

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DECpresent adheres to the DECwindows Style Guide and has the same look and feel of other DECwindows applications.

DECpresent is compliant with Digital's Compound Document Architecture (CDA) and can take advantage of the CDA converter architecture and system level support.

DECwindows Graphical Interface Tools for VMS

SPD: 32.27
UPI: XAQ

DECwindows Graphical Interface Tools for VMS are widgets which provide advanced programming capabilities for developers of applications based on the OSF/Motif, allowing customers to easily create graphical WYSIWYG (What-You-See-Is-What-You-Get) applications. This product is available separately or as a component of the DECwindows Tools Package for Motif, which provides a set of development tools for developers of Motif applications. Also included in this package are DEC VUIT V2.0 and LinkWorks Developer's Tools V1.0. The application deployment environment for applications written using the DECwindows Graphical Interface Tools and/or the LinkWorks Developer's Tools is included with VMS DECwindows Motif V1.0 at no additional charge.

DECwrite for ULTRIX

SPD: 25.K6
UPI: YG1

DECwrite for ULTRIX is a compound document processing application that allows ULTRIX users to create and format documents which contain text, graphics, images, and supported application data. DECwrite automates the steps of document production from text entry, formatting and graphics creation to printing.

DECwrite is compliant with Digital Equipment Corporation's Compound Document Architecture (CDA) and, therefore, can take advantage of the CDA converter architecture and system level support. This system level support includes the ability to mail compound documents across the enterprise.

DECwrite runs under DECwindows and utilizes a graphical What-You-See-Is What-You-Get (WYSIWYG) interface. The WYSIWYG interface displays the document on the screen as it print. This maximizes ease-of-use. DECwrite adheres to the DECwindows Style Guide and has the same look and feel as other DECwindows applications.

DECwrite combines word processing, publishing, graphics creation, data driven charting, image integration and live links to supported application data. A DECwrite user may create sophisticated compound documents for distribution throughout the enterprise.

DECwrite for VMS

SPD: 25.F6
UPI: VVF

DECwrite for VMS, is a compound document processing application that allows VMS users to create and format documents which contain text, graphics, images and supported application data. DECwrite automates the steps of document production from text entry, formatting and graphics creation to printing.

DECwrite is compliant with Digital's Compound Document Architecture (CDA) and, therefore, can take advantage of the CDA converter architecture and system level support. This system level support includes the ability to mail compound documents across the enterprise.

DECwrite runs under VMS DECwindows (included with VMS operating system) and utilizes a graphical What-You-See-Is-What-You-Get (WYSIWYG) interface.

The WYSIWYG interface displays the document on the screen as it will print. DECwrite adheres to the DECwindows Style Guide and has the same look and feel as other DECwindows applications.

DECwrite combines word processing, publishing, graphics creation, data driven charting, image integration and live links to supported application data. A DECwrite user can create sophisticated compound documents for distribution throughout the enterprise.

DECwrite presents functions through a graphical user interface. Functions are represented through straightforward menu selections and icons. DECwrite features a menu bar with pull-down menus at the top of the document window. These menus contain the top-level items such as File, Edit, Search, Type, Elements, Style, Draw, Links, Customize, and Help. The combination of pull-down menus, keyboard sequences, and dialogue boxes contain all of the functions needed to utilize DECwrite. The menus also display the keyboard equivalents provided to perform these functions from the keyboard.

In addition to the pull-down menus, DECwrite provides four context sensitive pop-up menus. These menus pop up near the pointer position for easy access. The pop-up menus include the most frequently used editing features for text and graphics, as well as the entries for the most commonly used element styles and objects.

DECwrite provides language switching which allows users to select a language from the DECwindows Session Manager to determine the user interface language for DECwrite.

DECwrite SGML Gateway and Development Tools for ULTRIX

SPD: 34.78
UPI: XSZ

DECwrite SGML Gateway and Development Tools for ULTRIX are companion products on the RISC ULTRIX platform. The Gateway and Development Tools support document conversion in a CALS (Computer Aided Acquisition and Logistics Support)-compliant environment. As a standalone product, the Gateway gives DECwrite the ability to become an SGML "feeder" system to composition systems, desktop publishing systems, and text databases from a variety of sources. When the SGML Development Tools are part of the solution, front and back end converters can be modified to support a variety of SGML Document Type Declarations (DTDs).

The DECwrite SGML Gateway offers bi-directional conversion of documents from DDIF to SGML and SGML to DDIF format. During import, the Gateway matches SGML tags with DECwrite styles. When exporting documents, the Gateway views the text to identify the document parts and applies the appropriate SGML tags using the Visual Recognition Engine (VRE) technology.

DECwrite SGML Gateway and Development Tools for VMS

SPD: 34.77
UPI: XSY

DECwrite SGML Gateway and Development Tools for VMS are companion products on the VMS platform. The Gateway and Development tools support document conversion in a CALS (Computer Aided Acquisition and Logistics Support) compliant environment. As a standalone product, the Gateway gives DECwrite the ability to become an SGML feeder system to composition systems, desktop publishing systems, and text databases from a variety of sources. When the SGML Development Tools are part of the solution, front and back end converters can be modified to support a variety of SGML Document Type Declarations (DTDs).

The DECwrite SGML Gateway offers bi-directional conversion of documents from DDIF to SGML and SGML to DDIF format. During import, the Gateway matches SGML tags with DECwrite styles. When exporting documents, the Gateway views the text to identify the document parts and applies the appropriate SGML tags using the Visual Recognition Engine (VRE) technology.

MicroVAX VSV21 Support Software

SPD: 28.20
UPI: 185

MicroVAX VSV21 Support Software is the software component of the VSV21 Q-22 Bus Color Graphics Module. The VSV21 Module requires some elements of the support software to be downloaded before operation; in particular, certain code must be loaded into the module to allow on-board interpretation of graphics display commands. MicroVAX VSV21 Support Software is a prerequisite for using all the capabilities of the VSV21 Module.

The package consists of a device driver, software modules, a configuration and control utility program (VSVCP), an installation verification procedure (VSV$IVP), and the VIVID subroutine library (VSL).

The software modules, which are loaded into the VSV21 Module using the VSVCP, allow terminal emulation, VSV11 emulation, or VSV21 VIVID display list processing.

VAX DECslide

SPD: 26.11
UPI: 361

VAX DECslide is a menu-driven graphic presentation utility that runs on VMS operating system. It is intended for individuals who create or prepare materials for in-house presentations. A combination of symbols and text are used for menu selection.

VAX DECslide uses an interactive interface so that diagrams and text are displayed as they are entered. Editing functions permit changes to slides as they are created, or after they have been saved.

A strip (text) menu and message area at the bottom of the screen displays user options, help messages, and operation status. A directory feature lists the slides, including the date and time of creation, slide name and comments.

After slides are created, they can be colored with available color palettes. They can be printed (single or double size format), saved (filed), copied, exported, changed, or deleted.

Slides are saved in the current default VMS directory. Different directories can be used to group common slides together, and all are protected via the standard VMS protection mechanisms.

VAX ReGIS to Sixels Converter

SPD: 27.88
UPI: VEF

VAX ReGIS to Sixels Converter is a layered software product that allows users to convert ReGIS graphics files into color sixel files. These sixel files can be printed on Digital-supplied printers that support the sixel protocol.

The converter handles all ReGIS commands supported by the VT340, VT240, VT241, and VT125 with the exception of reports, scrolling, graphic cursor control, data movement control, hardcopy control, time delay, and temporary writing control.

The product also supports the ASCII and ISO Latin Alphabet Number 1 character sets.

VMS DECwindows Motif

SPD: 36.09
UPI: XA1 (End user)
XDD (Developer)

VMS DECwindows Motif provides a graphical user interface to VMS. DECwindows incorporates the Open Software Foundation's Motif user interface as the design center for DECwindows applications. OSF/Motif is a graphical user interface widely acknowledged as the industry standard. This user interface defines a powerful model for interacting with the VMS operating system using a point-and-click metaphor. DECwindows includes a set of integrated desktop applications that demonstrate the power of this metaphor and provide VMS users with a base set of desktop tools.

VMS DECwindows Motif is based on MIT's specification for the X Window System, Version 11, Release 4 and OSF/Motif V1.1.1. X Window System standards supported as part of DECwindows include the X11 network protocol, a base set of workstation fonts, the C language binding for the Xlib programming library and the C language binding for the Xtoolkit library. For workstations users, DECwindows support for the Adobe Display PostScript System is integrated into X11.

VMS Workstation Software

SPD: 28.06
UPI: A96

VMS Workstation Software (VWS) is a VMS layered product that provides windowing and graphics support for the VAXstation II, VAXstation II/GPX, VAXstation 2000, VAXstation 3100 Models 30/40/38/48 with GPX graphics and VAXstation 3200/3500.

VWS supports VAXstations with windowing, VT200 series terminal emulation with technical character set, TEK4014 and TEK4125 terminal emulation a simple mouse based human interface for window manipulation, a graphics programming interface, Hard Copy (HCUIS) for applications requiring hardcopy output, VWS/SIGHT, an easy-to-use tool that enables the user to create graphics, and a Migration Tools kit to assist users in migrating UIS applications to the DECwindows platform.

VMS Workstation Software features include: Multiple Overlapping Windowing system via the mouse; VT200 series terminal and TEK4014, TEK4125 Emulation Multiple VT200, series terminals; ReGIS Color Support, provides VT240 compatible subset of video-ReGIS graphics; Simple User Interface via the mouse; Workstation Setup that enables the workstation characteristics to be configured to customer requirements; On line Help; Programming Interface for workstation application development; Device Driver Interface for applications with special requirements; Hardcopy Graphics Support for applications requiring the generation of hardcopy output of graphics; and SIGHT (Simple Interactive Graphics Handling Tool) that enables the user to create graphics on a workstation.

DEC LMF PAK Generator for ULTRIX

SPD: 34.29
UPI: GT9

DEC LMF PAK Generator for ULTRIX software enables third parties to use Digital Equipment Corporation's License Management Facility (LMF) Software. It consists of the right to use the ULTRIX License Management Facility system service calls in any licensee's products using a single LMF Producer Name and LMF Issuer Name. It includes the PAK Generating software, consisting of a callable routine which generates a valid LMF checksum, and an application which issues and prints Product Authorization Keys (PAKs). The application uses the callable routine, however, the user may access the callable routine directly.

Prior to receiving the software, the third party must register their ISSUER and PRODUCER company name with Digital Equipment Corporation. This ensures that the PAKs they generate contains information unique to their company.

DEC LMF PAK Generator for VMS

SPD: 31.68
UPI: YWP

DEC LMF PAK Generator for VMS software enables third parties to use Digital Equipment Corporation's License Management Facility (LMF) Software. It consists of the right to use the VMS License Management Facility system service calls in any licensee's products using a single LMF Producer Name and LMF Issuer Name. It includes the PAK Generating software, consisting of a callable routine which generates a valid LMF checksum, and an application which issues and prints Product Authorization Keys (PAKs). The application uses the callable routine; however, the user may access the callable routine directly.

Prior to receiving the software, the third party must register their ISSUER and PRODUCER company name with Digital Equipment Corporation. This will ensure that the PAKs they generate will contain information unique to their company.

The callable routine accepts thirteen input arguments, verifies that the third-party company information matches the registered ISSUER and PRODUCER names, and returns a checksum.

The applications provides a utility to configure the application, and a utility to maintain a Product Reference File, also it issues and prints PAKs.

Included with each DEC LMF PAK Generator license is a self-paced instruction course. The course is provided to support the business practices and decisions associated with the introduction and use of the LMF as a license management tool.

DEC SecurityGate for VMS

SPD: 36.20
UPI: GZF

DEC SecurityGate software is a VMS layered software product that, when installed on a DECnet Phase IV routing node, provides an additional level of access control to that part of the network served by the routing node. A system or security manager can use the DEC SecurityGate software to create a security domain consisting of a group of nodes serviced by the router.

A system or security manager defines a set of access rules that apply to the security domain. Access to nodes in the security domain can be specified and controlled based on source and destination nodes, inbound and outbound communication lines, network object or task, and the day of week and hour of day.

The DEC SecurityGate software consists of a VMS pseudo driver that provides the network access control, a user interface program that creates and maintains rules databases and controls the loading of network access control rules, and an Ancillary Control Process (ACP) that provides event logging and loads rules into the pseudo driver.

DEC SecurityGate software pseudo driver software becomes part of the DECnet-VAX routing layer and examines each network packet passing through. Each packet is examined to determine if it is a Connect Request or a Reconnect Request. Only Connect and Reconnect Requests are further examined; all others are passed back to the router for forwarding.

The DEC SecurityGate forwards Connect Requests if permitted by the access rules but rejects Connect Requests if prohibited by the rules. Since only Connect Request packets and Reconnect Request packets are examined, the effect on network routing performance is small.

The ACP maintains an audit event file that automatically records all failed network connections and changes to the access rules. The user interface will display the entire audit file or create a report from selected portions which, in turn, can be either displayed or printed as a separate file.

The user interface also provides a test function. A security manager can determine if the rules that are defined will behave as expected by simulating Connect Requests and verifying that the rules either permit or deny access.

DECinspect for VMS

SPD: 26.N1
UPI: GKL

DECinspect for VMS is a software tool that a security or system manager uses to establish a custom security analysis and reporting system to manage the security of a network of distributed systems. With this tool, the security manager can implement and maintain a security standard that is consistent with corporate security policy for the VMS nodes in the distributed computing environment. Digital highly recommends that customers purchase security consulting services for assistance in designing and implementing a security analysis and reporting system that balances business needs with security requirements. Local Digital offices can assist customers in determining the appropriate services for their requirements.

DECinspect software is designed to run on every VMS node in a network to periodically evaluate compliance with a security policy defined by the security manager. Optionally, DECinspect software will work with DEC Security Reporting Facility (DECsrf) software (SPD 26.N2). DECsrf software is designed to run on one or more nodes to support centralized collection and management of compliance reports from DECinspect installations.

Using DECinspect software, the security manager defines settings (that are consistent with the organization's security policy) for the security relevant operating system parameters. DECinspect software establishes processes, called inspectors, to periodically evaluate the node for compliance with the established parameter settings an inspection. For VMS systems, inspector tests will evaluate security-relevant parameters in the following areas; Files and Directories, Accounts, Network settings and accounts, SYSGEN parameters, and Security auditing.

ULTRIX MLS+ Trusted Worksystem Software

SPD: 34.10
UPI: GXR (VAXstation 3100)
GNA (RISC)

ULTRIX MLS+ Trusted Worksystem Software, Version 1.0 extends ULTRIX Worksystem Software to provide a trusted operating system designed to meet B1 and CMW levels of security.

ULTRIX MLS+ Trusted Worksystem Software is a security-enhanced version of the ULTRIX operating system, with the industry standard OSF/Motif window manager and X11 window server. It is designed to label data and control access to different security levels of information. It provides many of the familiar features of ULTRIX, while incorporating high levels of security.

By design, the ULTRIX MLS+ system provides protected processing of sensitive information. The heart of the system is the Trusted Computing Base (TCB), a set of protection mechanisms that enforce the system's security policy.This policy protects information from disclosure to unauthorized users. Security features are transparent to applications, with the exception of a policy violation.

VAX Encryption

SPD: 26.74
UPI: 081

VAX Encryption is a layered product that offers customers the ability to enhance the security and integrity of data stored on their systems by encrypting that data and authenticating it.

VAX Encryption supports the use of encrypted manipulation detection codes (MDCs) and cryptographic message authentication codes (MACs). MDCs are generated by algebraic functions that accept the data as input. Examples of such functions include cyclic redundancy checks. VAX Encryption uses CRC-16 to calculate MDCs. MACs are generated by cryptographic functions that take the data as input. VAX Encryption uses the DES algorithm to generate MACs. The second stop is to recalculate the code as needed. If the calculated code is identical to the original code, there is assurance that the original data has not been altered.

VAX Encryption performs encryption and decryption of user data and generation of authentication codes for user data. This product provides a DCL interface from which users can encrypt and decrypt complete files and generate and verify MACs on complete files. Its application program interface allows application programs to encrypt and decrypt complete files or specific data elements and generate and verify MACs on specific data elements. An interface to the VMS backup utility allows users to maintain encrypted backup save sets.

This product contains a software implementation of the Data Encryption Standard (DES) algorithm, which is promulgated by the United States National Institute of Science and Technology. The DES cryptographic algorithm is a Federal Information Processing standard (FIPS PUB 46) and an American National Standards Institute standard (ANSI X3.106-1983).

VMS License Management Facility

SPD: 36.35
UPI: XAN

VMS License Management Facility allows the system manager to easily determine which software products are licensed on a standalone VAX and on each of the VAX systems in a VAXcluster System. It allows the system manager to select the subset of systems or users in a VAXcluster that may use the software products. LMF also provides an audit trail which allows the system manager to track license changes that occur within a VAXcluster system.

V5.x VAXcluster configurations are fully described in the VAXcluster Software Product Description (29.78.xx) and include CI, Ethernet and Mixed Interconnect configurations.

ALL-IN-1

SPD: 27.30
UPI: AAA

ALL-IN-1 is a customizable, menu-oriented software product that provides generic office applications and a facility for integrating other business oriented applications. ALL-IN-1 unifies these applications into an easy-to-use, menu-driven, information system.

Through ALL-IN-1's electronic mail is linked into Digital Equipment Corporation's networking facilities, users can transport or receive information that has been created on desktop, departmental, and corporate systems.

ALL-IN-1 DESKtop for DOS

SPD: 50.20
UPI: YFE

ALL-IN-1 DESKtop for DOS is a software package that integrates into the services provided by Digital Equipment Corporation's ALL-IN-1. It is a multi-lingual product offering Mail, File, and Application integration between the dissimilar DOS and ALL-IN-1 environments. By combining the main components of the DESKtop, such as Communications, Scripting Language and built-in DESKtop Applications, it is possible to extend the functionality of the DOS microcomputer via the centralized user interface. Such extensions provide Terminal Emulation, access to commonly used third party products both remote and local in nature, Message Based Applications, document conversion, and directory management. Other features can be added through the use of the available customization options.

ALL-IN-1 DESKtop Server for VMS

SPD: 31.71
UPI: YFF

ALL-IN-1 DESKtop Server for VMS is an ALL-IN-1 layered application that runs on a suitably-configured VMS host computer. It controls the exchange of inbound and outbound mailbags between ALL-IN-1 DESKtop users and ALL-IN-1. A mailbag is a single file comprised of one or more electronic mail messages and, optionally, their attachments as well as their associated envelope header information. The product also recognizes and executes Message Based Applications (MBAs) and File Transfer requests. The Server converts different document types using ALL-IN-1's conversion mechanism, the CDA Converter Library, or a third party product called KEYpak (if installed).

ALL-IN-1 Electronic Authorization and Routing System

SPD: 34.80
UPI: GJ6

ALL-IN-1 Electronic Authorization and Routing System, (ALL-IN-1 EARS), is a software product layered on ALL-IN-1 to provide serial and parallel routing of electronic "items" in ALL-IN-1. This system is based entirely on standard ALL-IN-1 forms and scripts, and is customized into the ALL-IN-1 Electronic Messaging subsystem. The system also uses standard ALL IN-1 file cabinet features to maintain the security and integrity of the items being routed.

The electronic items are defined in a database and can include objects such as word processing based documents, Forms Management System (FMS) Form based information, 4GL database information, CAD drawings, spreadsheets, and images. The status of any item's progress is always available to users.

ALL-IN-1 MAIL

SPD: 39.58
UPI: VZ8 (For DOS)
SPD: 39.59
UPI: YFT (Local Area Network)
YFU (Wide Area Network)
YCZ (Server for VMS)
YZ7 (For VMS DECwindows)
YHS (For Video Terminals)
SPD: 39.15
UPI: YZJ (Mail for Windows)
MCU (PATHWORKS Links)
LBJ (PATHWORKS for Windows)

ALL-IN-1 MAIL is an electronic messaging application, which implements the international messaging standards set by the CCITT X.400 P2 recommendations. It provides a means of exchanging messages and attached data with other users and is a consistent user interface across heterogeneous desktop devices in a client/server implementation. ALL-IN-1 MAIL also interacts with all other MAILbus gateways and complementary products.

ALL-IN-1 is a client/server implementation supporting video terminals, DOS PCs, and DECwindows VMS workstations. ALL-IN-1 MAIL represents an upgrade path for current users of Digital's VMS Personal Mail Utility (VMSmail), DECwindows VMSmail, or the PC Mail interfaces provided with the DECnet/PCSA product set.

ALL-IN-1 MAIL has no technical dependency on the ALL-IN-1 integrated office product. It can be used entirely independent of that product. DOS and DECwindows clients are also available, which connect directly into the ALL-IN-1 integrated office system base and do not require the ALL-IN-1 MAIL server.

Client software performs services for the user. This software usually resides on an intelligent desktop device and takes advantage of the processing power on the desk. Clients are connected to the ALL-IN-1 MAIL server, through which local- and wide-area network delivery services are performed.

Transport between ALL-IN-1 MAIL servers and between ALL-IN-1 MAIL and the other products in the ALL-IN-1 Phase II product family is performed by the VAX Message Router. Optional gateways can also be connected to the VAX Message Router as needed for mail transfer in a multivendor environment.

ALL-IN-1 MAIL for VMS

SPD: 39.59
UPI: YFT (Local Area Network Server)
YFU (Wide Area Network Server)
YCZ (Server for VMS)
VZ7 (VMS DECwindows)
YHS (For video terminals)

ALL-IN-1 MAIL for VMS is an electronic messaging application which implements the international messaging standards set by the CCITT X.400 P2 recommendations. It provides a means of exchanging messages and attached data with other users, and is a consistent user interface across heterogeneous desktop devices in a client/server implementation.

Layered on top of Digital Equipment Corporation's VAX Message Router (SPD 26.33), ALL-IN-1 MAIL interacts with all other MAILbus gateways and complementary products.

(Continued)

ALL-IN-1 MAIL for VMS *(Continued)*

ALL-IN-1 MAIL is a client/server implementation supporting Video Terminals, DOS PCs, the Microsoft Windows Environment, Apple Macintosh PCs, DECwindows VMS workstations, and other X11 display devices. ALL-IN-1 MAIL represents an upgrade path for current users of Digital's VMS Personal Mail Utility (VMSmail) or DECwindows VMSmail.

ALL-IN-1 MAIL has no technical dependency whatever on the ALL-IN-1 integrated office product. It may be used entirely independent of that product. DOS and DECwindows clients are also available which connect directly into the ALL-IN-1 integrated office system base and do not require the ALL-IN-1 MAIL Server.

ALL-IN-1 Manager for LANs

SPD: 36.59
UPI: XTJ (Manager for LANs)
XTK (Manager for WANs)
XTL (Desktop for LANs)
XTM (IOS for LANs)

ALL-IN-1 Manager for LANs is composed of two packages: ALL-IN-1 Manager for LANs and ALL-IN-1 Manager for WANs. ALL-IN-1 Manager for WANs is available as an optional add-on upgrade to ALL-IN-1 Manager for LANs only and does not stand on its own. ALL-IN-1 Manager for LANs provides office management services to end-users on heterogeneous PC LANs and provides integration with the ALL-IN-1 IOS environment. This product supports PATHWORKS, Netware, 3+, and Banyan PC LANs.

ALL-IN-1 Manager for LANs offers two supported user interfaces, the ALL-IN-1 DESKtop for LANs and the ALL-IN-1 IOS for LANs. ALL-IN-1 DESKtop for LANs is the standard desktop interface. ALL-IN-1 IOS for LANs is an ALL IN-1 IOS look alike client interface. While the product serves the PC LANs behind the scenes within a corporation's computer network, end users perform work through the menu-driven functions of the user interface.

This product is layered on the MS-DOS operating system, can operate on any MS-DOS platform, and does not depend on the underlying network protocol for compatibility and functionality.

The user for this product is a PC user on a Novell NetWare, PATHWORKS for DOS, 3Com 3+, or Banyan LAN. The environment addressed is based on typical ALL-IN-1 installed-base customer situations within Fortune 1,000 companies. The system environment of such large corporations' is necessarily diverse. It may consist of many different PC LANs, (local or remote) as well as IBM, Digital, and other system environments. The customer may have different installed office systems, such as ALL-IN-1 IOS electronic messaging, PROFS, SNADS, and others.

The end-user receives office services, i.e., mail, PC application integration, menu customization, etc., through the end-user interface.

The business manager gains the ability to deploy mission critical applications throughout the enterprise.

The MIS manager benefits with an office end-user management system that provides customizability, flexibility, easy system management, and security, across heterogeneous PC LAN platforms.

ALL-IN-1 PC Server for VMS

SPD: 31.71
UPI: YFF

ALL-IN-1 PC Server for VMS is a collection of executable images, DCL command procedures, ALL-IN-1 scripts, and data files. It allows an ALL-IN-1 system to be used as a server for the various PC clients.

The PC user has the ability to run ALL-IN-1 applications directly through terminal emulation or let the PC control mail and file movement. In terminal emulation, the ALL-IN-1 PC Server for VMS recognizes the session as an interactive session.

The ALL-IN-1 PC Server for VMS also has a simple user interface available to the VMS and/or ALL-IN-1 system manager for management functions.

ALL-IN-1 Personal Assistant

SPD: 37.53
UPI: MDX

ALL-IN-1 Personal Assistant is a product which is layered on top of a base ALL-IN-1 system.

ALL-IN-1 IOS is a customizable, menu-oriented software product that provides generic office applications and a facility for integrating other business oriented applications. ALL-IN-1 IOS unifies these applications into an easy-to-use, menu-driven information system.

Through ALL-IN-1 IOS's electronic mail and links into Digital Equipment Corporation's networking facilities, users can transport or receive information that has been created on desktop, departmental, and corporate systems.

ALL-IN-1 Personal Assistant enables users to track new ALL-IN-1 messages and locate documents within their ALL-IN-1 file cabinet using a variety of selection criteria. Use ALL-IN-1 Personal Assistant if receiving large amounts of mail or maintaining large numbers of documents.

The ALL-IN-1 Personal Assistant is an add-on subsystem to the standard ALL-IN-1 IOS product. ALL-IN-1 Personal Assistant extends ALL-IN-1 with a set of additional text searching and filtering functions. Additional forms are provided to assist users in dealing with the new capabilities.

ALL-IN-1 Personal Assistant helps the user deal with information by providing three sets of facilities: Standard Operations, Rule Specification, and scheduling of the application of rules to file cabinet documents.

ALL-IN-1 Services for DECwindows

SPD: 33.22
UPI: YG4

ALL-IN-1 Services for DECwindows provides a DECwindows style User Interface for ALL-IN-1, as well as extensions to ALL-IN-1 functionality. It works in conjunction with and assumes that ALL-IN-1 resides on the same system.

The ALL-IN-1 Services for DECwindows provides ALL-IN-1 users on X-Windows supported devices an alternate choice of user interface. Users can select either push button or pull down menus at any time during their ALL-IN-1 session, or can choose to use the standard FMS forms user interface.

Additionally, ALL-IN-1 Services for DECwindows allows compound document processing within ALL-IN-1 by allowing DECwrite to be used as an editor from the word processing menu. Documents created with DECwrite from ALL-IN-1 can easily be stored in the ALL-IN-1 File Cabinet.

ALL-IN-1 Services for DECwindows further enhances the CDA support of ALL-IN-1 by providing nine viewer windows.

ALL-IN-1 STARTER

SPD: 25.D9
UPI: VNN

ALL-IN-1 STARTER is a bounded, non-customizable, menu-oriented software product that provides the user with the ability to create, send, and receive electronic mail and to create, edit, and print word processing documents.

ALL-IN-1 STARTER provides an environment in which users access all of its functions in a consistent manner. Users' documents are stored in folders in the users' file cabinets where they are accessed from the word processing (create and edit messages) and electronic messaging (send and receive) functions.

ALL-IN-1 STARTER is a true subset of ALL-IN-1. ALL-IN-1 provides additional functionality such as customization, time management, and application integration / development. Within the limits of this subset, ALL-IN-1 STARTER is fully compatible with ALL-IN-1 (all data and training experience are transferable from one product to the other). ALL-IN-1 STARTER provides for ease in upgrading to ALL-IN-1. This upgrade does not require data conversion, but may require additional hardware and software resources to use the additional functionality of ALL-IN-1.

There is a restriction that ALL-IN-1 STARTER cannot be run on the same system node as ALL-IN-1.

ALL-IN-1 Voice Messaging Support

SPD: 26.44

ALL-IN-1 Voice Messaging Support is a software product that provides an interface between the ALL-IN-1 mail user and the voice store-and-forward system known as Voicemail.

The voice store-and-forward system allows users to send voice messages to other users of the Voicemail system, reply to messages received, delete and save messages, and more. Access to the system is made from a telephone equipped for tone dialing and commands are entered using the telephone keys.

The Voicemail system notifies the ALL-IN-1 Voice Messaging Support software running in the VAX over a local high-speed link of the arrival of voice messages. The Voice Messaging Support software passes these notifications on to the ALL-IN-1 user in the form of items of electronic mail. The notifications include information provided by the Voicemail system to identify the sender of the voice message, the date and time of recording, and the length (in seconds) of the message. Notification can also be sent over a DECnet network to any remote user addressable by message router.

Local and remote ALL-IN-1 users can, from their terminal, invoke the Voicemail system to call their own telephone, play the messages to the user, and request the system to delete the voice messages.

DEC CDA Invokers for VMS

SPD: 34.91
UPI: GVM

DEC CDA Invokers for VMS provides remote conversion capabilities for MS-DOS and Macintosh users who wish to convert their documents from a local format supported in the CDA Converter Library to another supported format.

DEC CDA Invokers for each platform consists of a server component located on a VAX running VMS, and a client component is located on a PC running its native operating system. The server communicates with the client application via DECnet and uses the CDA Base Services routines on the VAX to perform conversions for the client. Support for external references in DDIF/DTIF input files is included.

The MS-DOS client provides a command-line interface, while the Macintosh and MS-Windows clients provide a windowed interface. A library and a DLL containing the callable interface is also provided for MS-DOS. The windowed interface for MS-Windows is the same interface as provided by CDA Base Services, but with additional support needed for remote conversions.

DEC ODA Compound Document Architecture (CDA)

SPD: 32.10
UPI: YHN

DEC ODA Compound Document Architecture (CDA) Gateway provides an extensible interchange capability between CDA and ODA. The product can be used in stand-alone mode or over X.400, and will support internationally recognized Document Application Profiles (DAPS) (Q111, Q112, and Q121) as defined by the European Workshop for Open Systems (EWOS). The DEC ODA Compound Document Architecture (CDA) Gateway, when used over X.400, provides open systems access to and from CDA, and allows users to interchange CDA documents transparently in a multivendor heterogeneous environment.

DECdecision

SPD: 25.G2
UPI: VW3

DECdecision is a workstation-based decision support application. The system is comprised of four major components: Access, for ad hoc database queries; Calc, for analyzing financial and business data; Chart, for generating business graphs; and Builder, for recording and automating repetitive tasks across components.

DECdecision runs under the DECwindows X-Window environment and incorporates its common appearance and operation for pull-down menus, dialog boxes, windows, component cut and paste operations, and mouse pointing device support. DECdecision has a consistent appearance across the entire product, shared with other applications written under DECwindows.

DECdx/VMS

SPD: 26.36
UPI: 708

DECdx/VMS enables DECmate II and III systems, both standalone and shared resource, to be linked to the host for better system utilization, document exchange, and information and data sharing. Digital Standard Document Exchange (DX) error-detecting and error-correcting transmission protocol is used to transport documents in WPS file format.

Users of DECmates can use DECdx to transfer documents between the DECmate system and the VMS host over a serial line interface. The WPS-8 word processing document formats, and the print control characters are retained. During a DECdx session, the DECmate system operates as though it were another terminal on the host system.

DECdx/VMS features compatibility with WPS-PLUS, DECpage, and EDE products; shared access; and transfer, add, conversion, print, and index functions. Online user assistance, a user's manual, and installation instructions are included.

DECpage

SPD: 26.29
UPI: AAN

DECpage is a style-controlled batch formatter offered as a layered product. It uses WPS-PLUS documents for input to produce high-quality text or high-quality integrated text and graphics output to laser printers.

DECpage uses normal, italic, and bold fonts in a variety of proportionally spaced typefaces in several character sizes. DECpage produces most types of standard office documents, including memos, reports, business letters, directories, announcements, newsletters, and overhead transparencies.

DECpage formats an entire document with or without graphics, by performing automatic typeface selection, line justification, and pagination based on the user's selection of any of the 41 professionally designed print styles or additional styles created by the user.

DECpage features include WPS-PLUS and ALL-IN-ONE integration; graphics support (PostScript, ReGIS, Sixel, and GKS); clip-art; multiple language hyphenation; and multinational character set. Document construction includes table of contents, indexing, appendices and table of authorities generation; and a document preview option.

DECplan Client for ULTRIX/RISC

SPD: 31.29
UPI: YPB

DECplan Client for ULTRIX/RISC is an integrated time and project management tool designed to help users plan, track, schedule, and report on projects and meetings. DECplan is a client/server, DECwindows based tool that provides a server and two clients, the DECplan client and the DECplan Time Manager client. DECplan Time Manager is a subset of the DECplan client. The DECplan server manages a single DECplan database of information delineated by a series of planners; project, personal, equipment, and locations. Multiple DECplan or DECplan Time Manager clients can connect to a single server. These clients, when connected to the DECplan server, allow users to share project information stored in a common database.

DECplan for VMS

SPD: 33.09
UPI: YPB (Server)
XC6 (Client)
XC8 (Time manager client)
XNV (Time manager to client upgrade option)

DECplan for VMS is an integrated time and project management tool designed to help users plan, track, schedule, and report on projects and meetings. DECplan is a client/server, DECwindows-based tool that provides a server and two clients, the DEC-plan client and the DECplan Time Manager client. DECplan Time Manager is a subset of the DECplan client. (See SPD 31.27.xx for details on the DECplan Time Manager client.) The DECplan server manages a single DECplan database of information delineated by a series of planners; project, personal, equipment, and locations. Multiple DECplan or DECplan Time when connected to the DECplan server, allow users to share project information stored in a common database.

DECplan Time Manager Client for ULTRIX/RISC

SPD: 31.28
UPI: YPB (Server)
XC6 (Client)
XC8 (Time manager client)
XNV (Time manager to client upgrade option)

DECplan Time Manager Client for ULTRIX/RISC is an integrated time and project management tool designed to help users plan, track, schedule, and report on projects and meetings. DECplan is a client/server, DECwindows based tool that provides a server and two clients, the DECplan client and the DECplan Time Manager client. DECplan provides a superset of the DECplan Time Manager functionality. (Refer to the DECplan for VMS Software Product Description SPD 33.09.xx for details on DECplan.) The DECplan server manages a single DECplan database of information delineated by a series of planners; project, personal, equipment, and locations. Multiple DECplan or DECplan Time Manager clients can connect to a single server. These clients, when connected to the DECplan server, allow users to share project information stored in a common database, schedule meetings, and exchange information.

DECtalk Mail Access

SPD: 26.45
UPI: 088

DECtalk Mail Access is an ALL-IN-1 software application that provides users with convenient access to their ALL-IN-1 documents and messages from a touch-tone telephone.

DECtalk Mail Access users can dial their ALL-IN-1 system from a touch-tone telephone and command the DECtalk unit to read their mail, reply to it by using a prewritten reply in a specific folder, or delete it. Nonmail messages can also be read and deleted.

Commands are entered using the telephone keypad to gain access to a user's account. The commands include the ability to select and read messages and documents, delete messages and documents, select and send standard answers to mail messages, and modify speech mode (by letter, word, or sentence) and speech rate (slow, normal, or fast).

System and user text-to-phone dictionary support is provided. This allows customization of the pronunciation of abbreviations and special words. The size of these dictionaries, which are loaded into the DECtalk's user-definable lexicon, are controlled only by the size of the DECtalk system lexicon.

System management options facilitate the authorization of user access, the specification of a site-specific welcome message, optional logging of transactions and errors, and the temporary suspension of all DECtalk Mail Access to the system.

DECtp Desktop for ACMS

SPD: 34.81
UPI: GZG

DECtp Desktop for ACMS (also referred to as "Desktop ACMS") is a layered software product that allows application programs running in DOS and Macintosh operating system environments to access VMS-based ACMS transaction processing applications through a desktop programming interface.

There are three Network Application Support components included in the product; Desktop ACMS Client for DOS, Desktop ACMS Client for Macintosh, and Desktop ACMS Server for VMS.

(Continued)

DECtp Desktop for ACMS *(Continued)*

The desktop server software component resides on the host VMS system. The desktop client components reside on the desktop operating systems and provide an application programming interface for customer-written desktop client programs. Digital Equipment Corporation's PATHWORKS products supplythe software networking connection between the client and server systems. A client for VMS is provided for development purposes only (it is identical to the client for DOS)

External Document Exchange with IBM DISOSS

SPD: 26.92
UPI: 761

External Document Exchange with IBM DISOSS is a VMS layered product that allows Digital office automation users to access text information distributed through or contained in an IBM DISOSS/370 system. Users of Digital's ALL-IN-1 or DECdx/VMS can search for, retrieve, file, or delete documents in IBM DISOSS Library Services.

Through DISOSS Distribution Services, Digital office automation users can send and receive documents to and from users of IBM office systems connected to the DISOSS/370 system. Thus, users can receive documents created by other users in an IBM SNA office network environment, edit it locally on the Digital system, distribute it through a Digital office network, and print it out or file it in the DISOSS/370 document library.

External Document Exchange with IBM DISOSS uses a menu interface that can be added to the ALL-IN-1 office system or invoked from the DCL system prompt when used with DECdx/VMS. Supported functions correspond to the command structure of Library and Distribution Services found in IBM's DISOSS/370 office applications. The user interface for the search, file, retrieve, and delete document, send, obtain, show and cancel distribution were produced for compatibility with Digital standard user interface requirements for office products. The product includes context specific, online HELP.

External Document Exchange with IBM DISOSS retrieves both DCA Revisable Form Text and DCA Final Form Text documents. EDE with IBM DISOSS converts the IBM DISOSS DCA-formatted text into Digital document exchange (DX), DEC Standard Document File Format, and stores the converted documents in the users' DECdx or ALL-IN-1 filing cabinet. Documents being sent from the Digital system for filing in or distribution through the IBM DISOSS system are converted from DX format into IBM DCA Revisable Form. ASCII and other text files sent from ALL-IN-1 are converted into DCA Final Form documents prior to filing in or distribution through the IBM DISOSS/370 system. When using the WPS-PLUS word processing editor under ALL-IN-1, conversions between WPS-PLUS and DX format occur without user intervention. Otherwise, the Convert Document utility within ALL-IN-1 allows the conversion of documents to and from other formats used by ALL-IN-1.

The library search function of External Document Exchange creates an index of DISOSS documents on the VAX system. This simplifies subsequent access to those documents since users need only refer to this index to use the document in the DISOSS/370 database. A single command can be used to obtain all documents awaiting delivery to a user from DISOSS Distribution Services.

International Lexicons for ULTRIX

SPD: 31.05
UPI: VYL

International Lexicons for ULTRIX are encoded lists of the most frequently used words for a specific language. One or more language lexicons can be added as layered products to run with some Digital applications, including DECwrite.

Additional lexicons allow users to check spelling in two variations of English (American and British); French (French, Canadian, or European); German (Deutsch, High German, or Swiss); Dutch (Nederlands); Swedish (Svenska); and Spanish (Espanol), all within a single document when used with applications that have implemented the multilingual spell check feature. American Business and Medical International lexicons are also available.

The American and British English Lexicons each contain more than 87,000 entries and are both based on the American Heritage Dictionary.

The American Business Lexicon contains over 95,000 entries. These include the same entries as found in the American English Lexicon and specialized entries, including Latin terms, case law terms, legislative acts, terms that are specific to the full range of legal practices, stock terms, arbitrage terms, proper names, and insurance underwriting and claim reporting terms.

The American Medical Lexicon contains over 157,000 entries and includes the International Lexicon/American for ULTRIX or RISC entries and specialized entries, including biological, biochemical, anatomical, and physiological terms; names of diseases; trade and generic names of drugs; medical and surgical procedures; and medical equipment and instruments.

International Lexicons for VMS

SPD: 31.04
UPI: VYH

International Lexicons for VMS are wordlists used for spell checking verification and correction within WPS-PLUS (in ALL-IN-1), WPS-PLUS for VMS, DECwrite for VMS, or DECpresent for VMS. Users can purchase one or more of these optional lexicons to provide multilingual spell verification and correction capability to be used with any of these VMS writing applications. Each lexicon consist of a list of words, similar to a dictionary, but without the associated meanings. Users select the words or document to be spellchecked and choose the appropriate lexicon purchased.

Language and Specialized Lexicons for VMS

SPD: 29.61
UPI: VI7

Language and Specialized Lexicons for VMS consists of lists of words, similar to dictionaries but without the associated meanings. One or more languages or specialized lexicon products can be purchased to add as a layered application to run with WPS-PLUS/VMS.

Specialized lexicons include American Business Lexicon, American Medical Lexicon, British Lexicon, German Lexicon, and French Lexicon. The French and German Lexicons verify spelling only and do not offer corrections.

American Lexicon contains over 87,000 entries. Additional lexicons can be purchased that allow users the capability to check spelling in two variations of English (American and British), French (Canadian or Parisian), or German (High German or Swiss). American Business Lexicon contains over 95,000 entries; American Medical Lexicon contains over 157,000 entries; and British Lexicon contains more than 87,000 words.

Session Support Utility

SPD: 27.79
UPI: VE3

Session Support Utility (SSU) is a VMS layered software product that allows users to log into and maintain multiple independent sessions on a VMS system using Digital's VT330, VT340 or VT420 terminals. SSU software can be activated on either of the two communication ports on these terminals.

Session Support Utility supports three (3) types of connections to a VMS host: hardwired ASYNC line, mode, or LAT line.

VAX ADE

SPD: 25.76
UPI: 425

VAX ADE is specifically designed to help managers, administrative and clerical personnel, and other office professionals manage their own information. ADE users can create and manage information files as well as produce a variety of reports. An on-line tutorial makes ADE extremely easy to learn, while extensive HELP messages and a self-prompting command structure make ADE easy to use. ADE allows users to produce and use simple applications without learning programming techniques or languages.

The ADE user defines a Worksheet by naming the column headings needed for the data. The data is then entered through the user's terminal and is displayed on the terminal screen under the appropriate column headings. Data or columns can be added, changed, or deleted at any time. Column widths are automatically adjusted to accommodate the data being entered. Once entered, the data can be manipulated and reports can be printed.

The standard ADE report format automatically prints information in a columnar format, numbers pages, centers titles, and centers data under column headings. With a little more effort, the ADE user can select specific data to be printed and format the report to meet specific needs.

ADE uses Self-prompting Commands to manage information and to print reports. The user enters a single word command telling ADE what to do. If not sure which command to use, HELP will give the user a list of choices with a brief description, or the TRAIN command can be used to learn about the various commands. Once the command is entered, ADE prompts the user for any additional information that is needed. HELP and TRAIN are always available. As the user becomes more familiar with ADE, abbreviations can be used and the entire ADE command can be entered without selecting from the available options at each step. This greatly increases the frequent user's productivity.

VAX Computer Integrated Telephony Message Desk

SPD: 32.06
UPI: YG8

VAX Computer Integrated Telephony Message Desk (CITMD) enhances user interactions with office telephone systems by providing telephony, mail, and phonebook services.

VAX CITMD allows access to dialing services that provide dialing features, such as allowing users to place and answer calls using CITMD commands. Message services provide a means of organizing messages left for or by telephone callers. Phonebook services provide users with an online telephone directory.

Two sets of features are provided. Message Attendants answer calls on behalf of other users, and take and deliver messages, and maintain the online system phonebook. Possible attendants include a full time message desk attendant or a group secretary to whom others forward their phones. All other users of the application are considered general users. General users use CITMD to respond to telephone messages left for them, to make calls, and to provide a personal phonebook in addition to the generally available system phonebook.

VAX DECalc

SPD: 25.79
UPI: 310

VAX DECalc is an electronic spreadsheet package for creating, editing, and manipulating numbers in a worksheet format. This package is specifically designed for use on multiuser systems and over a network. VAX DECalc executes in the native mode under the VMS operating system and drives VT100, VT200 or VT300 series terminals. VAX DECalc comes with an extensive reference manual containing practice sessions and therefore, requires little computer experience.

VAX DECalc/DECgraph Package

SPD: 27.51
UPI: 924

VAX DECalc/DECgraph Package consists of two software products that are tightly integrated, VAX DECalc and VAX DECgraph. Data and labels can be extracted from the VAX DECalc spreadsheet and graphed directly with DECgraph.

VAX DECalc is an electronic spreadsheet package for creating, editing, and manipulating numbers in a worksheet format. VAX DECalc is specifically designed for use on multiuser systems and over a network. VAX DECalc executes in native mode under the VMS operating system and drives VT100, VT200, or VT300 series terminals. VAX DECalc comes with an extensive reference manual containing practice sessions and thus requires little computer experience.

VAX DECgraph can stand alone as a general purpose, graphics plotting package that runs under the VMS operating systems. Alternatively, when linked with VAX DECalc upon installation, it allows users to create, change, display, and print graphs using the spreadsheet for data.

Users access VAX DECgraph from within VAX DECalc via the EXTERNAL command. Using this interface the user can specify graph options, including: Title; Subtitle; Horizontal and Vertical labels; X and Y Values; Legends; references to the VAX DECalc grid, or independent data points; graph display types, including Line, Bar, and Pie; and whether the output should go to the screen or to a file.

VAX DECalc-PLUS

SPD: 27.37
UPI: A98

VAX DECalc-PLUS is a multiuser spreadsheet designed for technical, engineering, and scientific environments. VAX DECalc-PLUS combines an interactive spreadsheet with the ability to call external routines written in any programming language that supports the VMS calling standard. From within a VAX DECalc-PLUS session, the user can link in one or more external routines and use the spreadsheet grid boxes to hold parameters to be passed as inputs to the routine or to receive output from the routine. In addition, users can specify that a routine be iteratively executed a specified number of times. VAX DECalc-PLUS executes in native VMS and MicroVMS mode and drives VT100 or VT200 series terminals.

(Continued)

VAX DECalc-PLUS *(Continued)*

VAX DECalc-PLUS enables users to perform common mathematical, statistical, and financial analyses through built-in functions, including but not limited to the following: cosine, tangent, sine, logarithms; average, minimum and maximum value, least squares, standard deviation; and payment, payback, depreciation, and discounts. This spreadsheet also enables users to manipulate their data through DELETE, INSERT, MOVE, and REPRODUCE commands. The spreadsheet contains an extensive set of data manipulation functions and formatting capabilities.

VAX DECgraph

SPD: 26.07
UPI: 360

VAX DECgraph is a general purpose graphics plotting package that runs under the VMS operating system. VAX DECgraph allows users to create, change, display, and print graphs. Individuals can use VAX DECgraph for decision support and making presentations.

User interface features included: an interactive keyboard interface to create, change, and display charts; memu and submenus using symbols to display user options; a sample set of data files which is supplied with the installation kit; color palettes that can be used to select colors for the chart; one-line help facilities and task-oriented documentation; the ability to display an output file on any supported terminal device without running VAX DECgraph; completed charts from both interactive and noninteractive (VMS DCL) modes in either color ReGIS, black and white REGIS, or printer protocol formats; and a VMS printer queue that can be set up with a supported graphics printer to output printer protocol files.

VAX DECspell Verifier/Corrector

SPD: 26.34
UPI: 650

VAX DECspell Verifier/Corrector is a spelling verification and correction utility which runs under the VMS operating system. It has the capability of automatically scanning text documents or files and detecting spelling errors. It also offers a list of suggestions from which the user can select the correctly spelled word for substitution.

VAX DECspell is offered with either a master lexicon in American English or British English, each comprised of over 80,000 words. As an extra option, VAX DECspell may be upgraded to allow users to verify documents against either of these lexicons.

VAX DECspell uses the master lexicon together with over 12,000 additional, user-specified words. These user-specified words can be divided between the user's personal dictionary and up to ten other dictionaries. These additional dictionaries can be personal dictionaries or dictionaries shared with other users.

VAX Grammar Checker

SPD: 29.60
UPI: VFB

VAX Grammar Checker checks American English text for correct spelling, proper grammatical construction, and style. VAX Grammar Checker works best with text that follows standard rules of English, such as memos, reports, and business letters. It is not as useful for text that violates standard rules of English. Built on the Houghton Mifflin CorrecText Grammar Correction System, VAX Grammar Checker runs standalone under VMS.

VAX Grammar Checker accepts as input any document using WPS-PLUS/VMS V3.0, or any file with a VAX ASCII-based editor, such as EDT or TPU-based EVE. VAX Grammar Checker does not support documents that contain markup information.

VAX Grammar Checker is interactive, allowing users to display documents, identify selected regions of text to be checked, read the displayed grammatical comments, and make corrections with a limited set of editing functions. VAX Grammar Checker repeatedly processes a selected sentence until that sentence is determined to be correct, or until the user chooses to pass to the next sentence.

VAX Grammar Checker analyzes sentences for their grammatical form, not for their meaning, and determines whether the relationships among words are correct. To accomplish these tasks, VAX Grammar Checker uses a dictionary that includes more than 99 percent of the words used in average English writing. Entries in the dictionary include details about grammatical function, spelling, and word endings.

Grammar can be checked on a complete document, a selected region of a document, or on a sentence in a document. If an error is found, processing stops, the error is highlighted, and an explanatory message and a menu of correction options are provided.

Menu options include edit, replace, ignore, add, pass, finish, and more information. User selectable functions include the number of words splitting infinitives to flag as an error; the number of noun adjuncts to flag as an error; and the flagging of clustered prepositional phrases.

VAX Grammar Checker needs to distinguish sentential from nonsentential text as this helps to indicate whether to check only the spelling of the text block or to perform a more complete grammatical analysis. The set line spacing value function helps define some of the criteria for making this distinction. This option is available through the TPU interface. WPS-PLUS handles this option implicitly and requires no user interaction.

VAX Key Distribution Center

SPD: 27.77
UPI: 03U

VAX Key Distribution Center (KDC) is an integral part of an Ethernet security system designed to enhance the security of the Ethernet LAN (Local Area Network) environment. VAX KDC manages and controls the operations of a number of Digital Ethernet Secure Network Controllers (DESNCs) attached to a network. The DESNCs provide a number of security features, including encryption and decryption of Ethernet frames, node authentication and authorization, node access control, and management services.

The VAX KDC software enhances the security and integrity of distributed Ethernet systems by protecting data confidentiality and integrity; protecting against node masquerading; enforcing a network security policy; and extending security management, monitoring, and control.

This product manages all of the DESNCs in an Ethernet LAN or extended LAN environment. The software provides a user interface for a security manager or system manager to initialize DESNCs attached to a network, to establish the access rights of each client node that is connected to a DESNC controller, to select events that should be audited and alarmed, and to monitor the status of the DESNC controllers in the network. Summary reports of network usage and security-related events can also be provided.

(Continued)

VAX Key Distribution Center *(Continued)*

Features include LAN access control, initialization, key distribution and management, encryption mode, firmware authentication, key source options, auditing and alarming, multicast message forwarding, bypass and standby mode, and node restrictions.

Multiple VAX Key Distribution Center nodes can be used cooperatively in a LAN or extended LAN to enhance network availability. In the event that one of these nodes becomes inoperative, the other nodes will respond to requests for cryptographic keys and services from the network DESNC controllers.

VAX Software Project Manager

SPD: 27.52
UPI: A82

VAX Software Project Manager facilitates the estimating, planning, and controlling of software development projects. The software utilizes two user interaction modes. Menu mode visually presents project data in the form of trees, nodes, graphs, and charts. Users specify actions by pointing at objects and selecting menu features. DCL-style command line mode permits succinct expression and batch mode.

Using VAX Software Project Manager's planning, control, estimation, and environmental tools, users can input, manipulate, and view variable amounts of data.

The planning tools allow users to manipulate and analyze information about a project as a whole, individual tasks, milestones, and resources. Using a work breakdown structure, users construct a graphical, hierarchical representation of project tasks. Scheduling allows users to show dependencies among tasks, milestones, and the order in which tasks must be done. The planning tool includes Gantt and loading charts and a calendar.

The control tools track project status, determine progress trends, and measure and report progress against plan at the project and individual contributor levels. Specific control tools include status updating, rate charting, and reporting.

The estimation tools allow users to input an estimation hierarchy, cost driver values, lines of code estimates, and cost per phase. In return the estimation tools provide effort, scheduling, cost, and staffing level projections for the project's development phases.

The environmental tools let users decide which project database and resources to use and associated costs. Specific tools include resources, user preference, and projects.

VAX Software Project Manager includes a single database per project; multiple, concurrent users per database; database integrity and reliability; limited cost accounting; and statistics roll-up.

Reports and printouts include work breakdown structure; precedence diagram; project calendar; Gantt, loading, and rate charts; user-formatted, schedule, cost, and precedence reports; estimation project hierarchy; resource list; and contents of screen.

VAXlink for IMS and VSAM Client

SPD: 29.87
UPI: VFV

VAXlink for IMS and VSAM Client, a layered VMS software application, provides VMS users with unidirectional IBM mainframe database access and extract capabilities. VAXlink client works together with Answer/DB Extractor for VAXlink to provide intelligent access to IMS and VSAM data structures. VAXlink Client transfers extracted data to VAX Rdb/VMS databases.

Once on the VAX system, local users can manipulate and analyze the data using any VAX layered product or application that communicates with Rdb/VMS. The accessible IBM environments and databases include MVS, CICS, IMS/DC, TSO, IMS/DB, and VSAM.

A menu-driven, interactive program requests specific data from the VAX database administrator by creating a task that defines the data extraction. Task definition and processing involves examining a list of available mainframe databases and selecting the desired database, accessing the metadata provided by the VAXlink product server and using the metadata information to construct criteria for task data retrieval, submitting the task to the mainframe's Answer/DB Extractor products, and delivering the desired data to the VAX system.

Data may be simple queries or snapshots. Because users cannot access the data until it is installed in an Rdb/VMS database, the normal format will be snapshots taken at intervals determined by the database administrator.

VAXlink Client includes a menu interface; strip menus; functions arranged by screens and submenus; task processing; task definition; listing, archiving, and other task-related services; log on and log off scripts; per-function HELP; security; and multiple database support.

VAXmate Services for MS-DOS

SPD: 55.09
UPI: A9A

VAXmate Services for MS-DOS, a DECnet application, implements PCSA (Personal Computing Systems Architecture), allowing a VAXmate with a hard disk to act as a dedicated application, data, and resource server to groups of personal computers. This product provides file, print, date and time, and server management and control services. VAXmate Services for MS-DOS also includes the MS-DOS operating system and all DECnet-VAXmate facilities.

VXT Terminal Software

SPD: 31.34
UPI: XNG

VXT Terminal Software provides the user with access to host systems by establishing X Window System compliant sessions over Ethernet.

The VXT terminal Software is downline loaded into a VXT 2000 terminal from a load host utilizing TCP/IP and LAT, LASTport network protocols. The VXT software provides terminal emulation connections to host systems for conventional text-based applications.

Terminal sessions may use LAT and TELNET running on Ethernet or via a serial line port provided by the VXT 2000 terminal. A local window manager, running in the terminal, is provided to give the user high responsiveness when manipulating windows and to reduce network load. This local window manager is fully compliant with OSF/Motif Window Manager. A set of local fonts is provided to support local clients. Alternative fonts sets are available through TFTP, LAT and LASTport/disk. When a host system is available offering LASTport/disk, the VXT software provides a virtual memory capability. With the increased memory capacity, the ability to customize configurations of terminals and font management is made available.

WPS-PLUS/DOS

SPD: 30.70
UPI: 0F2

WPS-PLUS/DOS, a menu-driven document processing system, provides GOLD key style word processing to users of personal computers.

In addition to common word processing functions, WPS-PLUS/DOS provides multinational, technical, and scientific character sets, superscripts and subscripts, scientific equations, composite characters, and a two-dimensional editor for creating diagrams, line drawings, equations, and more. To simplify the processing of long, complex documents, the product generates a table of contents, numbered pages and footnotes, automatic headers and footers, and storage for rulers and print settings.

Other word processing features include list processing, cut and paste, spelling verification and correction, and a personal dictionary. The package also provides user-defined keys and a HELP facility.

WPS-PLUS/DOS documents can be converted to and from a DX file, ASCII file, and WPS-PLUS format; and can be transferred between supported WPS-PLUS/DOS and a personal computer, using the DECmate Floppy Utility.

WPS-PLUS for VMS

SPD: 26.27
UPI: AAM

WPS-PLUS for VMS is a menu driven document processing software system that provides GOLD KEY style word processing for VMS users. It allows WPS-PLUS users to create, format and print documents that contain text, includes Encapsulated PostScript (EPS) graphics and application data generated by a variety of Digital Equipment Corporation software products using the External Application Link. WPS-PLUS for VMS is installed as a layered product on VMS systems.

WPS-PLUS for VMS software is compatible with Digital's Compound Document Architecture (CDA); it provides document conversion to the Digital Data Interchange Format (DDIF). DDIF files may also be imported into the WPS PLUS system by using the document conversion features available from the WPS-PLUS Document Transfer Facility.

The WPS-PLUS for VMS product provides word processing, EPS graphics inclusion, Two-Dimensional Editing, Editor Math, and List and Sort Processing capabilities. These features can be used to create high quality, sophisticated documents for distribution throughout the enterprise.

WPS-PLUS/Workstation

SPD: 30.51

WPS-PLUS/Workstation is a document processing software system that provides Gold key style word processing for users of MS-DOS/PC-DOS.

WPS-PLUS features menu-driven document processing, including word and list processing with math and sort capabilities.

WPS-PLUS/Workstation allows MS-DOS/PC-DOS users to create, edit, and print documents; produce form letters and maintain mailing lists; retrieve documents by document name, number, or keyword; convert a WPS-PLUS document to and from a DX file format and ASCII file format; and communicate through user-developed scripts. Users can also create and modify printer attribute and character print tables; transfer documents with Digital hosts running WPS-PLUS/VMS or WPS-PLUS/ALL-IN-1, and include technical characters and scientific equations in a document.

DECmpp Parallel Programming Environment

SPD: 36.67
UPI: XT7 (License and documentation)
XT4 (Media)

DECmpp Parallel Programming Environment (DPPE) is a set of interactive, visually-oriented, window-based tools that help users run, debug, and analyze programs that run on the DECmpp 12000 Series systems. Data visualization features include the ability to display activity and data values in the PE array. DPPE consists of a symbolic debugger with execution control facilities, data inspector, machine and data visualizers, and statement level execution profiling tools integrated with the symbolic debugger.

DPPE is based on an X-windows user interface. When DPPE starts up, it creates a single window that covers the entire screen. The root window can have its size changed or be iconified. Each tool in DPPE occupies a separate application window within the root window. Each window has a label (usually the tool name) above the upper left corner of the window. Each window is composed of one or more panes, each of which has its own menu. Almost all DECmpp functions can be performed by simply selecting that function with the mouse.

DPPE can be started and program execution controlled at any point, even while an application is running. All other DPPE programming environment facilities are invoked from the symbolic debugger, usually when execution is stopped.

DPPE is composed of several pieces. The windowed user interface can execute on any DECstation workstation. While the Debugger Engine can execute on the DECstation 5000 Model 200 connected to the data parallel unit, a program that calls parallel code (code that executes in the DPU) can only be invoked on the console workstation (the workstation that is directly connected to the DPU). Therefore, if the program is run under debugger, part of the user interface can execute on any DECstation 5000 Model 200 on the network, but part of the debugger will be invoked on the console workstation.

DECtrace for VMS

SPD: 25.G1
UPI: VW2

DECtrace for VMS collects and reports on event-based data. This data is helpful for performance analysis, capacity planning, database tuning, error logging, and other areas in which detailed application or layered product specific performance and/or event information is useful.

DECtrace event data can be gathered from any VMS layered product or combination of products that contains DECtrace service routine calls. Customers can also put DECtrace event calls in their application code to collect event and performance data. DECtrace is designed to operate with minimal performance impact on the system and can be used in both development and production environments. DECtrace supports both single-node and VAXcluster environments.

DECtrace considers an event to be an application-defined occurrence. An event can have a start and an end (duration event) or can simply occur (point event). DECtrace allows events within layered products or customer application programs to be defined and data items to be associated with each event. These data items can be resource utilization statistics (for example, CPU time).

Additionally, data items specific to the Digital layered product, third-party layered product, or customer application can be associated with each event. These facility-specific data items might include information supporting database tuning, application-level error logging, and a range of other information logging needs.

MicroVAX 2000/VAXstation 2000 Diagnostic Package

SPD: 25.C3
UPI: AGX

MicroVAX 2000/VAXstation 2000 Diagnostic Package is a set of functional diagnostic tests and maintenance utilities.

Functional tests are run on each system power-up that check basic system hardware operation. The console display terminal will show a hexadecimal countdown beginning at F and counting down to 1. Tests are performed on power-up in the following sequence: base video subsystem tests (VAXstation 2000 only), time of year clock, battery/NVR tests, serial line controller tests, memory tests, memory management unit test, floating point unit test, interval timer test disk controller test, tape controller test, interrupt controller/system ID ROM tests, and daughter module option tests.

After completion of the power-on tests, the user can invoke one of several additional tests or maintenance utilities. These tests include TEST 0, which executes a serial string test of all devices in the system; TEST 50, a utility that displays the hardware configuration of the system; TEST 51, which allows the user to define a default boot device for automatic bootstrapping of the system; TEST 71, a disk verifier utility; TEST 90, a utility that is used with systems that are connected in a network configuration; and more.

The remainder of the package is extended diagnostics and maintenance utilities for Digital Equipment Corporation field service personnel and licensed customers. This series of routines requires the use of a special hardware key to invoke and execute.

TEST 60 is a utility that displays a circle/crosshatch pattern on the console monitor (VAXstation 2000 only). It is used by service personnel to check/adjust monitor linearity and aspect ratio.

TEST 72 is a utility that writes a special key on scratch floppy diskettes. After running a floppy diskette through this utility, the diskette can then be used with the field service system excerciser to do write testing of the floppy diskette subsystem.

TEST 101 executes the field service mode system excerciser. This test excercises each device once sequentially and then excercises all devices concurrently. This sequence is executed for two complete passes of all system devices present in the configuration. This test automatically stops after two complete passes and displays a test summary. Additional routines are included.

MicroVAX Diagnostic Monitor

SPD: 28.09
UPI: ABX

MicroVAX Diagnostic Monitor (MDM) is a standalone operating system designed to support the execution of diagnostics.

MDM is operated through two user interfaces, menu mode and command line mode. Menu mode provides structured control of diagnostic testing through menu selections. Command line mode provides interactive control of diagnostic testing through individual commands typed at a command line prompt as well as greater control of diagnostic operating conditions.

This product is available in two versions, a customer and a service version, both of which allow the user to select operations from the same menu. The service version supports command line mode.

MicroVAX Diagnostic Monitor CDROM Maintenance Diagnostic

SPD: 33.16
UPI: K32

MicroVAX Diagnostic Monitor CDROM Maintenance Diagnostic Kit allows the MicroVAX Diagnostic Monitor standalone operating system to be booted from an RRD4x CDROM reader connected to a KZQSA controller or to a DECsystem 5500's SCSI interface. It also allows MDM to be booted from an RRD4x or RRD50 CDROM reader connected to a KRQ50 controller. The CDROM loadable MDM system images are functionally the same as the loadable MDM images available in the RX50/TK50 version of MDM.

For VMS users, the CDROM Kit also includes a working directory called (MDMKITS) in which a number of useful MDM files are provided. These files include: VMS installable savesets for both the RA/RD/RF loadable MDM kits and the Ethernet loadable MDM kits, MDM release notes, MDM User documentation, and an MDM TK tape building file. A CDROM_README.TXT file located in the MDMKIT's directory provides information on the building of MDM TK50/70 tapes and any last minute updates not included in the MDM Release Notes.

The MicroVAX Diagnostic Monitor (MDM) standalone operating system with diagnostic programs runs on any valid MicroVAX or DECsystem based system to verify that the system is operating correctly. MDM is designed to be booted on a valid MicroVAX or DECsystem based system where it can test the system's devices. The main objective of the diagnostic testing is the isolation of problems to a field replaceable unit (FRU) that can be easily removed and repaired.

MDM is operated through two user interfaces, menu mode and command line mode. Menu mode provides an easy-to-use structured control of diagnostic testing through menu selections. Command line mode provides a more interactive control of diagnostic testing through individual commands typed at a command line mode prompt. Both interfaces offer full testing capability, but command line mode allows greater control of diagnostic operating conditions.

MicroVAX Diagnostic Monitor Ethernet Server

SPD: 29.89
UPI: A07

MicroVAX Diagnostic Monitor Ethernet Server allows the MicroVAX Diagnostic Monitor (MDM) standalone operating system to be loaded from a remote VMS host over the Ethernet. This is particularly useful in situations where local load devices are not available. The loaded system is functionally the same as the locally loaded MDM product available as ZNABX.

The MDM standalone operating system's diagnostic programs verify that the system is operating correctly and test the system's devices. Diagnostic testing isolates problems to a field replaceable unit (FRU) that can be easily removed and repaired.

MDM's user interfaces include menu and command line modes. Menu mode provides a structured control of diagnostic testing through menu selections. Command line mode provides an interactive control of diagnostic testing through individual commands typed at a command line prompt. Both interfaces offer full testing capability, but command line mode allows greater control of diagnostic operating conditions.

Available in two versions, MDM's customer version is shipped with every MicroVAX and the service version is described here. Both versions allow users to select operations from the same menu, but the service version provides full diagnostic testing and supports command line mode.

MDM provides Functional, Exerciser and Utility environments under verify or service modes for MicroVAX hardware testing.

MicroVAX Diagnostic Monitor RA/RD Kit

SPD: 31.82
UPI: A11

MicroVAX Diagnostic Monitor RA/RD Kit allows the MicroVAX Diagnostic Monitor (MDM) standalone operating system to be loaded from a fixed hard disk. The loaded system is functionally the same as the RX50 loaded MDM (available as ZNABX).

The MDM standalone operating system with diagnostic programs runs on a MicroVAX II/rtVAX/MicroVAX 3000 to verify that the system is operating correctly. MDM is designed to be booted on a MicroVAX II/rtVAX/MicroVAX 3000 where it can test the system's devices. The main objective of the diagnostic testing is the isolation of problems to a field replaceable unit (FRU) that can be removed and repaired.

MDM is operated through two user interfaces, menu mode and command line mode. Menu mode provides structured control of diagnostic testing through menu selections. Command line mode provides a more interactive control of diagnostic testing through individual commands typed at a command line mode prompt. Both interfaces offer full testing capability, but command line mode allows greater control of diagnostic operating conditions.

MicroVAX MIRA Switch Control

SPD: 27.86
UPI: 09T

MicroVAX MIRA Switch Control is the software for controlling a MicroVAX based MIRA System.

A MIRA System is comprised of dual MicroVAX computers, each supplied with its own power source and mounted in a single cabinet, or in two cabinets for larger configurations. The configuration of each computer is normally identical, so one computer is a backup for the other in the event of failure.

The computers are linked via Ethernet and MIRA unique hardware. The software controls the status (Master, Standby, or Idle) of each computer. It detects a computer failure and changes the status of each computer accordingly. Designated devices that were previously connected to a failed Master computer are connected to the Standby computer, whose status then becomes Master. The user can then restart applications on the new Master and continue operation.

MIRA Systems are particularly suited to dedicated control applications, rather than general purpose data processing. That is, applications can maintain communication with terminals and other computers, maintain full performance after a failure, or recover without operator intervention.

VAX-11/725/730 Diagnostic Set

SPD: 25.93
UPI: 200

VAX-11/725/730 Diagnostic Set includes micro- and macrodiagnostic programs required to support Customer Runable Diagnostics (CRDs). The microdiagnostic programs detect and isolate faults at the module level within the CPU, Floating Point Accelerator (FPA), Integrated Disk Controller (IDC), and memory. A microdiagnostic monitor and test overlays achieve module-level fault isolation. The macrodiagnostic programs detect and isolate faults within the VAX-11/725/730 and standard options. The Customer Runable Diagnostics (CRD) feature is a simplified operator interface that sequentially runs the micro- and macrodiagnostic programs.

VAX-11/750 Diagnostic Set

SPD: 26.42
UPI: 201

VAX-11/750 Diagnostic Set is a set of programs that allows users to maintain a VAX 11/750 Central Processor Unit (CPU) and standard VAX-11/750 peripheral devices. The set includes micro- and macrodiagnostic programs required to fully support diagnosis on VAX-11/750 systems.

The microdiagnostic programs detect and isolate faults at the micro level within the CPU and memory. The microdiagnostic monitor and a number of test overlays achieve module-level fault detection and isolation.

At the start of the microdiagnostic program, a ROM-based TU58 driver routine loads the microdiagnostic monitor from a TU58 tape cartridge into RAM memory located on the VAX-11/750 diagnostic module, LOOO6-YA. Then the program initialization routine begins. That routine controls program flow, initializes parameters, and invokes the TU58 driver routine to automatically load each of a series of overlays. The microdiagnostic tests are organized to sequentially test the data path hardware, CMI-translation buffer-cache, I-stream buffer, CMI, and the memory controller and first two arrays. Detected faults result in error typeouts indicating the lowest level of modules and/or gate arrays to which the program can isolate the failure.

The macrodiagnostic programs provide fault detection and isolation within the VAX-11/750 CPU and standard options.

VAX-11/780 Diagnostic Set

SPD: 26.41
UPI: 200

VAX-11/780 Diagnostic Set is a set of programs that allows users to maintain a VAX-11/780 Central Processor Unit (CPU) and standard VAX-11/780 peripheral devices. The set includes micro- and macrodiagnostic programs required to fully support diagnosis on VAX-11/780 systems.

The microdiagnostic programs detect and isolate faults at the module level within the CPU, floating point, and memory. The microdiagnostic monitor and a number of test overlays achieve module-level fault detection and isolation. Microdiagnostics are executable with the microdiagnostic monitor running in the VAX-11/780 LSI-11 console. The console disks provide storage for the microdiagnostic test overlays. Microdiagnostic tests are organized into a bootstrapping sequence for testing the console interface, data path hardware, SBI-Cache Translation Buffer, I-stream Buffer, SBI, and Memory Controller, arrays, and Floating-Point Accelerator (FPA). All detected faults result in error typeouts that indicate the smallest set of modules to which the program can isolate a failure.

The macrodiagnostic programs provide fault detection and isolation within the VAX-11/780 CPU and standard options.

VAX-11/780 Microprogramming Tools

SPD: 25.09

VAX-11/780 Microprogramming Tools enable a programmer to assemble and load microprograms for the User Writable Control Store (UWCS) option of the VAX-11/780 CPU. The tools consist of MICRO-2, an assembler written in BLISS-32 for user-written source microcode; VAXDEF, the definition file that describes to the assembler the VAX-11/780 microarchitecture; MICLD, a utility program to load the UWCS memory of a VAX-11/780 CPU from a VAX-11/780 WCS microprogram object file; and a tool verification test that invokes a sample program to ensure that the tools have been installed correctly.

VAX-11/785 Diagnostic Set

SPD: 26.81
UPI: 210

VAX-11/785 Diagnostic Set allows users to maintain a VAX-11/785 central processor unit (CPU) and standard VAX-11/785 peripheral devices. The set includes micro- and macrodiagnostic programs required to fully support diagnosis of a VAX-11/785 system.

The microdiagnostic programs detect and isolate faults at the module level in the CPU, floating point, and memory. The microdiagnostic monitor and a number of test overlays achieve module-level fault detection and isolation. Microdiagnostics are executable with the microdiagnostic monitor running in the VAX-11/785 LSI-11 console. The console disks provide storage for the microdiagnostic test overlays. Microdiagnostic tests are organized into a bootstrapping sequence for testing the console interface, data path hardware, SBI Cache-Translation Buffer, I-stream Buffer, SBI, and Memory Controller, arrays, and Floating-Point Accelerator (FPA). Detected faults result in error typeouts that indicate the smallest set of modules to which the program can isolate a failure.

The macrodiagnostic programs provide fault detection and isolation within the VAX-11/785 CPU and standard options.

VAX-11/785 Microprogramming Tools

SPD: 26.63

VAX-11/785 Microprogramming Tools enable a programmer to assemble and load microprograms for the User Writable Control Store (UWCS) feature of the VAX-11/785 CPU.

VAX-11/785 Microprogramming Tools consist of MICRO-2, an assembler for user-written source microcode; 785DEF, the definition file that describes to the assembler the VAX-11/785 microarchitecture; MICLD, a utility program to load the User Writable Control Store memory of a VAX-11/785 CPU from VAX-11/785 WCS microprogram object file; and a tool verification test that invokes a sample program to ensure that the tools have been installed correctly.

VAX 6000 Diagnostic Set

SPD: 33.55
UPI: K34 (VAX 6000 Models 200, 300, 400)
K33 (VAX 6000 Models 500, 600)

VAX 6000 Diagnostic Set is a package of programs and documentation that allows users to maintain VAX 6000 Series central processor units (CPUs), memory, and standard peripheral devices. The set consists of ROM-Based and loadable macrodiagnostic programs which are required to fully support diagnosis of a VAX 6000 Series system.

The VAX 6000 Series systems are currently available in the following models: VAX 6000-2x0, VAX 6000-3x0, VAX 6000-4x0, and VAX 6000-5x0, where x = 1 through 6, depending on the number of processor modules on the system. For example, a VAX 6000-540 system would contain four of the Model 500 processors.

The heart of a VAX 6000 Series system is the XMI internal bus. CPUs, memory, I/O controllers, and adapters to the VAXBI I/O buses are connected to this XMI bus, and are referred to as XMI nodes. The system can contain one or more VAXBIs and peripheral device adapters and controllers reside there. They are referred to as VAXBI nodes.

(Continued)

VAX 6000 Diagnostic Set *(Continued)*

XMI and VAXBI nodes have extensive self-tests built into them (primarily ROM-Based), and these are automatically executed when the system is initialized. This minimizes the number of loadable macrodiagnostics required for maintenance of VAX 6000 Series systems. In addition, most XMI nodes and some VAXBI nodes contain user invokable ROM-Based Diagnostics which are accessible through the system console.

The UNIBUS is supported on VAX 6000-2x0, 3x0 and 4x0 Series systems to a limited extent, and a small number of existing UNIBUS peripheral devices can be used. This requires loadable macrodiagnostics to be used for maintenance of these devices.

VAX 6200/6300 Series Diagnostic Set

SPD: 25.C9
UPI: K12

VAX 6200/6300 Series Diagnostic Set is a package of programs and documentation that allows users to maintain VAX 6200/6300 Series central processor units (CPUs), memory, and standard peripheral devices. The set consists of ROM-based and loadable macrodiagnostic programs that are required to fully support diagnosis of a VAX 6200/6300 Series system.

CPUs, memory, and adapters to the I/O buses are connected to the XMI internal bus, and are referred to as XMI nodes. The I/O buses consist of one or more VAXBIs, and peripheral device adapters and controllers reside there and are referred to as VAXBI nodes.

XMI and VAXBI nodes have self-tests built into them (primarily ROM-based), and these are automatically executed when the system is initialized.

Components of the set include ROM-Based Diagnostic Monitor (RBD Monitor), a program that resides in ROM on various XMI and VAXBI nodes and supplies diagnostic and operator services for the ROM-based diagnostics accessible from the system console; ROM-based Diagnostics, diagnostic programs that reside in ROM on various XMI and VAXBI nodes and are invokable on power-up, reset, and/or by the operator via the RBD Monitor; VAX Diagnostic Supervisor (VAX/DS), a loadable program that supplies diagnostic and operator services for the loadable diagnostics; and VAX/DS Diagnostics, loadable macrodiagnostics that consist of exercisers, functional-level and logic-level tests, disk formatters, and autosizers that run under control of VAX/DS.

VAX 6400 Series Diagnostic Set

SPD: 31.55
UPI: K21

VAX 6400 Series Diagnostic Set is a package of programs and documentation that allows users to maintain VAX 6400 Series central processing units (CPUs), memory, and standard peripheral devices. The set consists of ROM-based and loadable macrodiagnostic programs that are required to fully support diagnosis of a VAX 6400 Series system.

The heart of the VAX 6400 Series system is the XMI internal bus. CPUs, memory, and adapters to the I/O buses are connected to the XMI internal bus, and are referred to as XMI nodes. The I/O buses consist of one or more VAXBIs; peripheral device adapters and controllers reside there and are referred to as VAXBI nodes.

XMI and VAXBI nodes have self-tests built into them (primarily ROM-based), and these are automatically executed when the system is initialized. This minimizes the number of loadable macrodiagnostics required for maintenance of VAX 6400 Series systems. In addition, most XMI nodes and some VAXBI nodes contain user-invokable, ROM-based diagnostics that are accessible through the system console.

The UNIBUS is supported on VAX 6400 Series systems to a limited extent, and a small number of existing UNIBUS peripheral devices can be used. This requires loadable macrodiagnostics to be used for maintenance of these devices.

VAX 8200/8300 Diagnostic Set

SPD: 27.81
UPI: K10

VAX 8200/8300 Diagnostic Set is a package of programs that allows users to maintain a VAX 8200/8300 central processor unit (CPU), memory, and standard VAX 8200/8300 peripheral devices. The set consists of macrodiagnostic programs which are required to fully support diagnosis of a VAX 8200/8300 system.

The heart of the VAX 8200/8300 system is the VAXBI internal bus. CPU, memory, and some peripheral adapters and controllers are connected to this bus, and are referred to as VAXBI nodes. All VAXBI nodes have extensive Self-tests built into them, and these are automatically executed when the system is initialized. This minimizes the number of macrodiagnostics required for maintenance of VAX 8200/8300 systems.

The UNIBUS is supported on VAX 8200/8300 systems, and many existing UNIBUS peripheral devices can be used. This requires macrodiagnostics to be used for maintenance of these devices.

In summary, macrodiagnostics are used for fault detection and isolation within some VAXBI nodes and all UNIBUS peripherals. This complements the extensive self-test capabilities of VAX 8200/8300 Systems.

VAX 8500/8550/8700/8800 Diagnostic Set

SPD: 27.82

VAX 8500/8550/8700/8800 Diagnostic Set allows users to maintain VAX 8500/8550/8700/8800 systems. These diagnostic programs test the CPU, memory, and peripheral devices. The package includes both micro- and macrodiagnostics.

The microdiagnostic components detect and isolate solid faults at the module level within the CPU and memory. The microdiagnostic tests are controlled by the micromonitor, which is built into the system console software. The console provides storage for the microdiagnostics tests.

Microdiagnostics tests are organized in a bottom-up test sequence. This sequence first tests the console, then the instruction unit, execution unit, cache, and memory. Microdiagnostics also test fault conditions on the NMI bus. All detected faults result in error typeouts that indicate the smallest set of modules to which the program can isolate a failure.

The macrodiagnostics components provide fault detection and isolation within the VAX 8500/8550/8700/8800 CPU and standard options.

VAX Diagnostic Supervisor (VDS) supplies diagnostic operator services such as loading, starting, and control as a standalone non-VAX-VMS controller or as a process under VAX VMS.

Diagnostics consist of exercisers, and functional-level and logic-level tests that run under the control of VDS. Functional-level tests run in standalone mode or with VAX VMS. Repair-level programs run only in standalone mode.

VAX 8600/8650 Diagnostic Set

SPD: 26.82

VAX 8600/8650 Diagnostic Set allows users to maintain a VAX 8600/8650 central processor unit (CPU) and standard VAX 8600/8650 peripheral devices. The set includes micro- and macrodiagnostic programs required to fully support diagnosis of a VAX 8600/8650 system.

The microdiagnostic programs detect and isolate faults at the module level in the CPU, floating point, and memory. The microdiagnostic monitor and a number of test overlays achieve module-level fault detection and isolation. Microdiagnostics are executable with the microdiagnostic monitor running in the VAX 8600/8650 LSI-11 console. The console disks provide storage for the microdiagnostic test overlays. Microdiagnostic tests are organized into a bootstrapping sequence for testing the console interface, data path hardware, SBI-Cache-Translation Buffer, I-stream Buffer, SBI, and memory controller, arrays, and floating-point accelerator (FPA). Detected faults result in error typeouts that indicate the smallest set of modules to which the program can isolate a failure.

The macrodiagnostic programs provide fault detection and isolation in the VAX 8600/8650 CPU and standard options including a VAX Diagnostic Supervisor, Diagnostics, and supporting programs.

VAX 8820/8830/8840 Diagnostic Set

SPD: 25.C7

VAX 8820/8830/8840 Diagnostic Set is a package of programs that allows users to maintain VAX 8820/8830/8840 systems. These diagnostics test the CPU, memory, and peripheral devices. The package includes both micro and macro diagnostics.

The microdiagnostic components detect and isolate solid faults at the module level within the CPUs and memory system. They are controlled by the MICROMONITOR, which is built into the VAX console software that is shipped with the system. The console provides the storage for the microdiagnostics tests. Microdiagnostics tests are organized into a bottom-up test sequence. This sequence first tests the console, then the instruction unit, execution unit, cache, and memory. Microdiagnostics are also used to test fault conditions on the NMI bus. All detected faults result in error typeouts that indicate the smallest set of modules to which the program can isolate a failure.

The macrodiagnostics components provide fault detection and isolation within the VAX 8820-8840 CPUs and standard options.

VAX Diagnostic Supervisor (VDS) supplies diagnostic operator services (loading, starting, and control) as a standalone controller (non-VMS) or as a process under VMS.

Diagnostics consist of exercisers, functional level and logic level tests that run under the control of VDS. Functional level tests run in standalone mode or with VMS. Repair level programs run only in standalone mode.

VAX 9000 Series Diagnostic Set

SPD: 32.22
UPI: K23

VAX 9000 Series Diagnostic Set is a package of programs that allow users to maintain a VAX 9000 system. These diagnostics test all subsystems of the VAX 9000 system including the Power Control System, Service Processor System, CPU, Memory, I/O Adapters, and peripheral devices. The package includes firmware-based tests, service processor-based tests, and macrodiagnostics.

The firmware-based components are comprised of functional tests that are executed by microprocessors located on various subsystem modules. These tests provide fault detection and indicate the failing replaceable unit by illuminating an LED located on the failing unit. In addition, diagnostic messages may be displayed in the HEX display on the operator control panel or be displayed on the Service Processor console. These tests are executed automatically during system power-on or controlled by issuing commands from the Service Processor console.

The standard COBOL data type used in the data processing industry is known as a packed-decimal string. It was created to store data more efficiently on disk at a time when disks were much more expensive than they are today. Third-party vendors for the commercial market usually make their layered software execute instructions quickly using packed-decimal data types. Therefore, the packed-decimal performance of the VAX 9000 will be important for mainframe customers who run third-party commercial packages or have developed their own programs using the packed-decimal string instruction set in firmware.

On the VAXserver 9000 packages, Digital has offered a non-optimized version of the packed-decimal string instruction firmware. The Commercial Instruction Set (CIS) option may be added to the VAXserver packages using the CIS Upgrades. Server systems that have the CIS Upgrade will have comparable COBOL packed-decimal string instruction performance to similarly-configured VAX 9000 mainframe systems.

The Service Processor-based components are comprised of functional diagnostics and structural tests that use the VAX 9000 maintenance facilities such as SCAN and BIST. These tests verify the integrity of the CPU, memory, and I/O adapters. Some of these tests are executed automatically during system startup. All of these tests can be controlled by issuing commands on the Service Processor console. Failure reports from these diagnostics indicate the set of replaceable units that may be at fault. All failure reports are displayed on the Service Processor console.

The Macrodiagnostic components provide fault detection and isolation within the VAX 9000 CPUs and standard options. Most macrodiagnostics are executed in conjunction with the VAX Diagnostic Supervisor (VAX DS).

The VAX Diagnostic Supervisor supplies diagnostic operator services (i.e., loading, starting, and control) as a stand-alone controller (non-VAX-VMS) or as a process under VAX VMS.

The Macrodiagnostics consist of exercisers, functional-level and logic level tests that run under the control of VAX DS. Functional-level tests run in stand-alone mode or with VAX VMS. Repair-level programs run only in stand-alone mode.

VAX DEC/Test Manager

SPD: 26.68
UPI: 927

VAX DEC/Test Manager automates regression testing by executing user supplied tests and automatically comparing the results with the expected test results. VAX DEC/Test Manager gives the software engineer flexibility in organizing tests, selecting tests for execution, and verifying and reviewing test results. Batch applications and interactive applications which input and output text to character cell terminals or DECwindows applications on VMS can be tested using VAX DEC/Test Manager.

VAX DEC/Test Manager supports the DECwindows software environment and provides either a DECwindows or command line user interface. VAX DEC/Test Manager is included in the VAXset Software Engineering Tools Package. This package provides simplified ordering and maintenance of various tools. Refer to the VAXset Package Software Product Description (SPD 27.07) for more information on VAXset.

VAX Diagnostic Program Macros Library

SPD: 26.25
UPI: ZE0

VAX Diagnostic Program Macros Library is a set of macros that establish the interface between a diagnostic program and the VAX diagnostic supervisor.

The VAX Diagnostic Program Macros Library is provided in three versions: MACRO-32, BLISS-32, and C.

VAX Performance Advisor

SPD: 27.71
UPI: VE5

VAX Performance Advisor (VPA) is a DECwindows based VMS layered product that reduces the time and effort required to manage and monitor VAX system performance, as well as plan for future resource requirements. It can be used with standalone VAX, VAXcluster and Local Area VAXcluster systems, as well as Mixed-interconnect VAXcluster systems.

VPA gathers VMS system data and through the application of expert system technology, analyzes the data, identifies specific conditions causing performance degradation, and presents detailed evidence to support its conclusions. Further, VPA provides recommendations for attaining improved system performance.

In addition to its expert system analysis, the VAX Performance Advisor assists in capacity planning exercises by providing data archival and graphing capabilities for long term trend analysis, and performance modeling to determine future system performance given changes in workload or configuration.

VAX Performance and Coverage Analyzer

SPD: 26.76
UPI: 119

VAX Performance and Coverage Analyzer helps VMS users analyze the execution behavior of their application programs and is an aid in tuning the performance and testing of applications programs. It pinpoints execution bottlenecks and other performance problems in applications programs and provides test coverage analysis by measuring which parts of a user program are executed or not executed by a given set of test data.

VAX Performance and Coverage Analyzer includes the Collector, which gathers performance or test coverage data on the running user program, and the Analyzer, which later processes and displays the collected data. The Collector gathers the performance data and writes that information to a data file. Once the data has been collected into a data file, the Analyzer can be run using that data file as input. The Analyzer is a separate program that reads the data file produced by the Collector and presents the results as performance histograms or other displays.

The Collector and the Analyzer are fully symbolic and use the Debug Symbol Table (DST) information in the user program to access the symbolic names of program locations. Applications written in any VMS language that produces DST information can be analyzed using VAX Performance and Coverage Analyzer.

VAX Software Performance Monitor

SPD: 27.56
UPI: 850 (Full function)
VUP (Collector facility)

VAX Software Performance Monitor (VAX SPM) is a software performance management facility for VAX and VAXcluster systems. VAX SPM can collect, archive, display, analyze, report and graph performance information useful in system tuning, trend analysis and workload forecasting. This information includes resource utilization and load balance data for single node, multi-CPU, and VAXcluster systems. VAX SPM software is designed for use by system managers and system programmers.

VAX SPM Collector Facility provides a flexible facility for collecting and archiving performance data. Data may be collected using a variety of user specified qualifiers and parameters. The user can start and stop data collection for all nodes in a VAXcluster or from remote nodes in a distributed system from a single terminal, and archive all the performance data into a single history file.

VAX Source Code Analyzer

SPD: 27.63
UPI: 382

VAX Source Code Analyzer is an interactive, multilanguage, multimodule, source code cross-reference and static analysis tool that helps developers analyze an entire system as opposed to individual modules. It also helps developers understand unfamiliar systems. This product is useful during the implementation and maintenance phases of a project.

The query feature allows users to search and display specific symbol, file, and module information. Previously entered queries can be maintained, reused, and used in new queries.

VAX Source Code Analyzer helps answer common source code questions such as where a particular global variable is declared, initialized, modified, or referenced; which modules contain references to a particular symbol name; whether the calling arguments are consistent; and where a specific routine is called.

This product is integrated with the VAX Language-Sensitive Editor. The editor, together with the Source Code Analyzer, provides developers with an integrated environment for source code development and maintenance. When the software is used with one of the supported VAX language compilers, developers can interactively edit, compile, debug, navigate, and analyze source code from a single session.

VAXft System Services

SPD: 31.64
UPI: YEA

VAXft System Services is a VMS layered software product. When combined with base VMS and the VAXft series hardware, VAXft System Services provides the full fault tolerant system capabilities. The resulting features include automatic failover, configuration management, automatic dial-out notification, and component fault isolation and recovery

VAXft System Services software is used by System Managers, Operations, and Field Service personnel to perform system management and maintenance operations. The software is transparent to the system users as well as to VMS layered products and applications.

DEC File Optimizer for VMS

SPD: 36.21
UPI: GJ8

DEC File Optimizer for VMS is a layered software product which reduces file fragmentation and optimizes file placement through scheduled defragmentation jobs.

DEC Network Save and Restore for ULTRIX

SPD: 36.17
UPI: MA5 (VAX single-use)
GZK (VAX server)
MA6 (RISC single-use)
GZL (RISC server)
XYX (VAX and RISC client)

DEC Network Save and Restore for ULTRIX provides backup services to either a single system or to a group of systems on a TCP/IP network.

Backup/Restore is a routine system management function where redundant copies of data are made to improve data integrity.

DEC Security Reporting Facility for VMS

SPD: 26.N2
UPI: GKM

DEC Security Reporting Facility for VMS (DECsrf) is a software tool that a security or system manager uses, in conjunction with DECinspect software (SPD 26.N1), to establish a custom security analysis and reporting system to manage the security of a network of distributed systems. With these tools, the security manager can implement and maintain a security standard that is consistent with corporate security policy for the VMS nodes in the distributed computing environment. Digital highly recommends that customers purchase security consulting services for assistance in designing and implementing a security analysis and reporting system that balances business needs with security requirements. Local Digital offices can assist customers in determining the appropriate services for their requirements.

DECsrf software is designed to run on one or more nodes to support centralized collection and management of compliance reports from DECinspect installations. DECinspect software is designed to run on every node in a network to periodically evaluate compliance with a security policy defined by the security manager.

Optionally, DECinspect software can be configured to send summary security status messages (called tokens) to a DECsrf installation. While DECinspect can be used alone in small distributed systems, managing a large number of nodes or a set of nodes on a dispersed network can be very difficult. DECsrf centralized management capabilities can be very helpful in these situations.

If centralized management is desired, the customer will establish one or more DECsrf installations on the network. Typically, DECsrf installations will be set up to support the organizational reporting structure (e.g., one DECsrf node per organizational management domain). The specific DECsrf installation that a DECinspect node reports to is specified during installation of the DECinspect software. DECsrf software performs integrity checks to prevent unauthorized modification of token information during transmission from DECinspect installations.

DECelms

SPD: 31.79
UPI: YFP

DECelms (DEC Extended Local Area Network Management Software) is a VMS layered product that allows users, at a VAX host, to configure, manage, monitor, control and observe any LAN Bridge and FDDI Wiring Concentrator in the "Extended LAN" and FDDI network environment. The term LAN Bridge is used to refer to Digital's LAN Bridge 100, LAN Bridge 150, LAN Bridge 200, DECbridge 500, METROwave, and Chipcom's Ethermodem Broadband Bridge.

The LAN Bridge products are the primary building blocks of the "Extended LAN" (Local Area Network) architecture. An Extended LAN is a collection of LANs that are interconnected and logically appear as one large Local Area Network. The DECconcentrator is the primary building block of the FDDI network environment. Together these environments are physically and logically attached and extended via the DECbridge 500. The DECbridge 500 is the device which allows Ethernet and FDDI networks to transparently communicate.

The LAN Bridge products operate at the data link level, and the FDDI DECconcentrator operates at the physical link level. Both product sets are transparent to upper level protocols.

DECelms resides on a VAX host. Corresponding management firmware resides in the LAN Bridges and FDDI DECconcentrators. The management protocol is used to communicate between the VAX host and the target LAN Bridges and FDDI DECconcentrators. DECelms provides additional functionality to support the actual control and observation of the target LAN Bridges and FDDI DECconcentrators.

DECmcc Basic Management System

SPD: 32.48
UPI: YSU

DECmcc Basic Management System software implements Digital's Enterprise Management Architecture (EMA) director model, consistent with the ISO/OSI management framework. The DECmcc Basic Management System (BMS) software, initially implemented under the VMS operating system lets users control, monitor and test manageable objects (entities) in a network.

The EMA Director Model defines a management platform called a director, and cooperating but independent software components named, management modules. DECmcc BMS is comprised of 3 types of director and management modules they are; the Access Modules (AMs) that provide access to and information about different classes of entities, the Function Modules (FMs) that provide high level management functions for managed entities, and the Presentation Modules (PMs) that provide a consistent user interface for Function modules.

DECmcc Developer's Toolkit

SPD: 32.49
UPI: YSW

DECmcc Developer's Toolkit is a VMS layered product used for the development of application-specific DECmcc access modules. The development tools run on any host VAX computer under VMS operating systems. The DECmcc Developer's Toolkit is for experienced network managers and system software developers.

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DECmcc Developer's Toolkit *(Continued)*

The DECmcc Director or Basic Management System software is required for enrolling, testing and operating access modules developed using the Toolkit. The DECmcc system software simplifies the design and implementation of application-specific access modules by offering a runtime kernel executive, various service programs, and source code for a Sample Access Module.

The Toolkit includes documentation and several software development utilities and testing tools.

DECmcc Director

SPD: 32.46
UPI: YM9

DECmcc Director software implements Digital's Enterprise Management Architecture (EMA) director model, consistent with the ISO/OSI management framework. The DECmcc Director software, initially implemented under VMS operating systems, lets users control, monitor, and test manageable objects (entities) in a network.

The EMA Director Model defines a management platform called a director and cooperating but independent software components named, management modules. The DECmcc Director is comprised of three types of director and management modules are; the access modules (AMs) provide access to and information about different classes of entities, the function modules (FMs) provide high level management functions for managed entities, and the presentation modules (PMs) provide a consistent user interface for function modules.

DECmcc Enterprise Management Station

SPD: 31.88
UPI: YFV

DECmcc Enterprise Management Station (DECmcc EMS) is a network management software product designed to provide network managers with a complete set of applications to manage wide area heterogeneous networks.

The DECmcc Enterprise Management Station consolidates Digital Equipment Corporation's network management applications within a DECwindows environment and provides the capability of running all applications on a single system. It consists of products that are compliant with Digital's Enterprise Management Architecture (EMA) as well as products that are not EMA-compliant. As such, DECmcc EMS is a transition vehicle to an EMA compliant product set within a single software product.

DECmcc EMS supports the ability to install and run other VMS layered products within a DECwindows environment. DECmcc EMS also provides access to non-Digital management products that are based on X11 standards. Such products can be installed on the same or separate processors as DECmcc EMS for the purpose of consolidating interfaces on a single workstation display. Also included with the DECmcc EMS components is the Network Troubleshooting Guide. Available through the Bookreader application, the Network Troubleshooting Guide provides DECmcc EMS users with a systematic, on-line approach to solving some of the most common problems that occur on DECnet-VAX, DECnet-ULTRIX, Ethernet, and TCP/IP networks.

DECmcc Extended LAN Manager AM

SPD: 31.33
UPI: GX8
GX9 (License required with DECmcc Director V1.1)

DECmcc Extended LAN Manager AM is a VMS layered product that allows users, at a VAX host, to configure, manage, monitor, control, and observe any LAN Bridge, DECbridge 5xx, 6xx, and DECconcentrator 500 physical media variants in the "Extended LAN" and FDDI network environment. The term LAN Bridge is used to refer to Digital Equipment Corporation's LAN Bridge 100, LAN Bridge 150, LAN Bridge 200, METROWAVE Bridge, and Chipcom's Ethermodem Broadband Bridge.

The LAN Bridge and DECbridge products are the primary building blocks of the "Extended LAN" (Local Area Network) architecture. An Extended LAN is a collection of LANs that are interconnected and logically appear as one large Local Area Network. The DECconcentrator family of products is the primary building block of the FDDI network environment. Together these environments are physically and logically attached and extended via the DECbridge family of products. The DECbridge product line is the family of products which allow Ethernet and FDDI networks to communicate transparently.

The LAN Bridge and DECbridge products operate at the data link level, and FDDI DECconcentrators operate at the physical link level. Both product sets are transparent to upper level protocols.

DECmcc Extended LAN Manager AM resides on a VAX host. Corresponding management firmware resides in the LAN Bridges, DECbridges, and FDDI DECconcentrators.

The management protocol is used to communicate between the DECmcc VAX host running the DECmcc Extended LAN Manager AM software and the target LAN Bridges, DECbridges, and FDDI DECconcentrators. DECmcc Extended LAN Manager AM provides additional functionality to support the actual control and observation of the target LAN Bridges, DECbridges, and FDDI DECconcentrators.

DECmcc Management Station for ULTRIX

SPD: 33.18
UPI: YU1 (VAX)
YUG (RISC)

DECmcc Management Station for ULTRIX, (DECmcc MSU), is an integrated set of network tools designed to manage multivendor networks. It has a DECwindows based graphical user interface that allows a user to manage TCP/IP objects using Simple Network Management Protocol (SNMP), and DECnet Phase IV objects using DNA Network Information and Control Exchange (NICE) protocol.

It provides management capabilities in the areas of Configuration, Fault, and Performance and has a Report Generation capability that allows users to store and retrieve management information on the users' networks. It uses an ULTRIX/SQL relational database (included with ULTRIX Operating System) to store the map representation, object and service information, the Management Information Base (MIB) data dictionary, alarm data, and reporting data. Sophisticated users can use SQL report generation capabilities to create customized reports.

In the area of Configuration Management, DECmcc MSU allows the user to add, modify, query and delete information about various objects or services associated with those objects. It also provides for installation of SNMP agents on remote systems, starting demons on distributed hosts, and the addition of object identifiers for the vendor-specific portion of MIB into the ULTRIX/SQL database. DECmcc MSU provides agents for previous versions of ULTRIX. DECmcc MSU also provides the function of Autotopology, building the map automatically while determining which TCP/IP routes and hosts exist on the network.

(Continued)

DECmcc Management Station for ULTRIX *(Continued)*

The Fault Management functions assist in the diagnosis of network failure conditions. They allow the customer to query or set MIB variables for TCP/IP objects and NICE variables for DECnet objects, and perform reachability tests to check connectivity of TCP/IP and DECnet nodes.

The Performance Management functions allow the user to see what is happening on the network backbone and on individual hosts. It provides the essential network statistical information to enable users to identify trends and design and plan the network. It allows the user to look at the load on the Ethernet backbone and provides percentage utilization of the backbone bandwidth. It also allows the capability to monitor MIB variables, and displays the MIB variables in real time and through a bar graph.

DECmcc Site Management Station

SPD: 31.87
UPI: YGL

DECmcc Site Management Station (DECmcc SMS) is a network management software product designed to provide network managers with a complete set of applications to manage wide area heterogeneous networks.

The DECmcc Site Management Station consolidates Digital Equipment Corporation's network management applications within a DECwindows environment and provides the capability of running all applications on a single system. It consists of products that are compliant with Digital's Enterprise Management Architecture (EMA) as well as products that are not EMA-compliant. As such, DECmcc SMS is a transition vehicle to an EMA compliant product set within a single software product.

DECmcc SMS supports the ability to install and run other VMS layered products within a DECwindows environment. DECmcc SMS also provides access to non-Digital management products that are based on X11 standards. Such products can be installed on the same or separate processors as DECmcc SMS for the purpose of consolidating interfaces on a single workstation display. Also included with the DECmcc SMS components is the Network Troubleshooting Guide. Available through the Bookreader application, the Network Troubleshooting Guide provides DECmcc SMS users with a systematic, on-line approach to solving some of the most common problems that occur on DECnet-VAX, DECnet-ULTRIX, Ethernet, and TCP/IP networks.

DECmcc TCP/IP SNMP Access Module for VMS

SPD: 32.50
UPI: YSV

DECmcc TCP/IP SNMP Access Module for VMS is a component of the EMA compliant DECmcc family of products. It provides DECmcc with access to systems in a TCP/IP network that have a Simple Network Management Protocol (SNMP) agent. Using SNMP protocol, the DECmcc TCP/IP SNMP AM provides DECmcc with data to perform configuration management on these devices, and monitor and control them via the DECmcc Forms and Command Line (FCL) user interface.

The DECmcc TCP/IP SNMP AM along with the DECmcc Basic Management System becomes a Manager with the following SNMP capabilities: it fully conforms to the Internet Advisory Board RFC 1098 (SNMP), and supports the SNMP Get, GetNext and Set operations; it fully supports the Structure of Management Information (SMI) as specified in Internet Advisory Board RFC 1065; and it fully supports the Management Information Base (MIB I) as specified in Internet Advisory Board RFC 1066.

In addition, the DECmcc TCP/IP SNMP AM is a fully integrated component of DECmcc. The DECmcc Forms and Command Line (FCL) user interface allows identification of TCP/IP systems by IP address "dot" notation, or by domain name. The DECmcc Alarms Function Module and the Configuration Function Module support TCP/IP systems as accessed via SNMP.

The DECmcc TCP/IP SNMP AM uses the VMS/ULTRIX Connection software from Digital as the transport mechanism to communicate with TCP/IP systems, and to translate internet domain names.

DECmcc TCP/IP SNMP AM includes extensive on-line information similar to VMS HELP. Help information is provided in the following four categories: Entity information, Function information, Presentation information, and Tutorial information.

DECmcc WANdesigner

SPD: 35.45
UPI: YMG

DECmcc WANdesigner is an interactive VMS layered software product that enables users to design and evaluate wide area networks (WANs). With WANdesigner, users can design new WANs or evaluate changes to existing ones based on cost considerations, equipment and application data, and performance requirements. Changes to existing networks can be planned in advance and alternative designs can be generated for comparison purposes.

WANdesigner enables users to conduct what-if analyses on existing networks or suggested network designs. For example, users can make manual modifications of network components, change applications, traffic, or design goals and have WANdesigner compute the result to analyze the effect of the proposed changes.

Using a device that supports VAX GKS software, users can display and interact with network topology maps. Such maps, with WANdesigner's DECforms-based menu interface, enables users to describe and map exiting networks, estimate network performance, design new networks, and generate reports.

DECperformance Solution Accounting Chargeback

SPD: 36.60
UPI: XTX

DECperformance Solution Accounting Chargeback generates a report of charges based upon system resource utilization with user specified resource pricing.

The DECps Solution Accounting Chargeback product uses VMS accounting data to produce system ulitization reports. These reports show monetary amounts charged for various types of system resources based upon unit prices provided by the user. The report can be used as an itemized bill or as a general resource utilization report.

DECps Solution Accounting Chargeback provides the user with the capabilities to gather the data needed allow the user to effectively manage the allocating of costs of an existing system.

DECperformance Solution Capacity Planner

SPD: 36.04
UPI: GX3

DECperformance Solution Capacity Planner determines system performance levels for various workloads and configurations.

DECps Capacity Planner allows the system manager to define the system's total workload in terms of manageable units which DECps will then report against. Workloads and groups of workloads (workload families) are used in model generation and can be reported against in DECps' Performance Evaluation Reports or Graphics. Workloads can be defined according to users, images, UICs, process name, account name and process mode.

DECperformance Solution Data Collector

SPD: 36.02
UPI: GX1

DECperformance Solution Data Collector records VMS system data for subsequent processing by the DECps advisor. The data collector runs as a detached process and is activated at system start up.

DECps Data collector collects data according to a user-defined schedule maintained in a schedule file; default collection is 24 hours per day, 7 days per week. The data collection schedule should be consistent for each node in the VAXcluster system to ensure all critical pieces of system data are collected. The data collector will automatically shut off when the disk on which the raw DECps data files reside has insufficient free space.

The Dump Report displays data from the DECps database files in user readable format. The user may select to dump the full database record, or may choose to dump a portion of the database record.

DECps Data collector provides data archiving capabilities so the VMS performance data collected by DECps on a daily basis can be used in long term performance studies. When DECps daily data files are archived, the resultant data files are known as history files. History files, which can be used as the data source for generating Performance Evaluation Reports, Dump Reports, and Graphs, are created according to user-specified reduction scheme(s). The user has the abilty to define specifically how the data will be archived by defining history file descriptor elements, such as the granularity, periodicity, time interval, model data, workload family, retention period, schedule, and holiday schedule. The size of the history file is dependent on the data reduction scheme selected with the most important element being the interval size defined. The size of reduced data, in blocks, is about 10 times smaller than it is in daily form.

DECperformance Solution Performance Advisor

SPD: 36.03
UPI: GX2

DECperformance Solution Performance Advisor analyzes VMS data through the application of expert system technology, identifies specific conditions causing performance degradation, and presents detailed evidence to support its conclusions. Further, the Performance Advisor provides recommendations for attaining improved system performance.

The DECps Performance Advisor contains a knowledge base of rules and thresholds which it uses to analyze VAX system data. The Performance Advisor rules fall into five categories: Memory, CPU, I/O, Cluster, and Miscellaneous.

The knowledge base may be modified and expanded at the user's discretion. To integrate new rules, modify existing rules, or effectively turn off existing rules, the user creates an auxiliary knowledge base. In subsequent analysis, the user can load the auxiliary knowledge base to augment DECps Performance Advisor factory rules.

The Performance Advisor produces an analysis report that aids the system manager in monitoring system activities and in making performance evaluations by quickly identifying performance problems. Through its analysis, DECps will also identify potential bottlenecks and the specific device on which the bottleneck will occur.

The Performance Advisor reports are generated at the request of the user and include: the Analysis Report, the Performance Evaluation Report, Line Graphs and Pie Charts. The Performance Advisor reports can be generated from either daily or historical data, with the exception of the analysis report which is generated from daily data files only.

DECram for VMS

SPD: 34.26
UPI: GJ9

DECram for VMS is a disk device driver that allows a VMS system manager to create pseudo disks (RAMdisks) that reside in VAX main memory for the purpose of improving I/O performance. Frequently accessed data can be accessed much faster from a DECram device than from a physical disk device. These RAMdisks can be accessed through the VMS file system just as physical disks are accessed, requiring no change to application or system software.

The number of DECram units used will most often be quite small (usually one, but sometimes two or more).

Since VAX main memory is allocated for the DECram device, a substantial amount of extra memory is generally required. The amount of memory dedicated is selectable. The VMS system manager designates the amount of memory dedicated to the DECram device(s) and the files that will be stored on it. The maximum size of a DECram device is 524,280 blocks.

DECscheduler for VMS

SPD: 32.19
UPI: YLL

DECscheduler for VMS is a distributed scheduling product that automates the execution of repetitive production jobs on VMS systems. (A job is a DCL command file or a VMS command string.) DECscheduler for VMS separates information that specifies how jobs should be run from the jobs themselves. It automatically takes care of the job rescheduling calculation, completion notification, and so on. A scheduled job can run when constraints on its execution are met. There are two types of constraints: the time must be later than the job's scheduled time, and all of the jobs that the job depends on must have completed successfully later than the last time the job completed. A job can depend on up to 16 other jobs, which can be within a VAXcluster or on remote nodes of a wide area DECnet network.

Job database information can be accessed through DCL commands. Most commands can also work remotely over the network, allowing centralized control of distributed applications.

DECscheduler for VMS has full VAXcluster failover capabilities. Jobs can be divided into steps. Interrupted jobs can be automatically restarted at the current step on another node in the VAXcluster or restricted to a single node. An installation-modifiable, load-balancing procedure can be invoked at execution time to select the VAXcluster node for job execution.

The product includes an event logging and reporting facility that can be used to produce job reports.

DECtrace

SPD: 25.G1
UPI: VW2 (Development)
VW4 (Runtime)

DECtrace for VMS is a layered product that collects and reports on event based data. This data is helpful for performance analysis, capacity planning, database tuning, error logging and other areas in which detailed application or layered product specific performance and/or event information is useful. DECtrace event data can be gathered from any VMS layered product or combination of products that contains DECtrace service routine calls. Customers can also put DECtrace event calls in their application code to collect event and performance data. DECtrace is designed to operate with minimal performance impact on the system and can be used in both development and production environments. DECtrace supports both single-node and VAXcluster environments.

DECtrace considers an event to be an application-defined occurrence. An event can have a start and an end (duration event) or can simply occur (point event). DECtrace allows events within layered products or customer application programs to be defined and data items to be associated with each event. These data items can be resource utilization statistics (for example, CPU time). Additionally, data items specific to the Digital layered product, third-party layered product, or customer application can be associated with each event. These facility-specific data items might include information supporting database tuning, application-level error logging, and a range of other information logging needs.

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Digital Cartridge Server Component (DCSC) for VMS

SPD: 33.59
UPI: YWN

Digital Cartridge Server Component (DCSC) for VMS provides the software front-end interface to the StorageTek 4400 Automated Cartridge System (StorageTek ACS). It can be installed on either a single VAX computer or a VAXcluster.

DCSC manages the StorageTek ACS transport assignments to a VMS system. This includes managing the allocation of ACS transports, locking and unlocking both cartridge and transport resources to accommodate user tape function requests, and recovering any unused resources (caused by a user mounting a tape and logging out before dismounting it).

When a user requests a tape function such as mount, DCSC checks for the existence of the requested cartridge, selects an available StorageTek ACS transport, and locks the required resources. DCSC ensures the tape cartridge is physically loaded onto a StorageTek transport and, if requested, executes a VMS tape mount function. Once a tape cartridge is mounted, DCSC makes it possible for users to request a VMS copy or backup function to read data from or send data to the cartridge.

NMCC/DECnet Monitor

SPD: 26.91
UPI: VTG (Base system)
VM8 (Right-to-copy)

NMCC/DECnet Monitor is a network monitoring system for Phase IV/IV+ DECnet network nodes. It runs as a layered application on VMS Systems and does not require any additional hardware or software on the remote DECnet nodes to be monitored. NMCC/DECnet Monitor collects and monitors data concerning the DECnet network. NMCC/DECnet Monitor enables the user to store, distribute, analyze, and evaluate the data into useful and comprehensible information, and to present the data either as a screen display or as a printed report.

NMCC/DECnet Monitor consists of software modules which combine to form a comprehensive monitoring system. The central component of NMCC/DECnet Monitor is the Kernel, a data acquisition process, which collects data from the network using polling and/or event logging. Polling can be used to obtain status, characteristics and traffic/error counters. Event logging can be set up to cause remote nodes to log events automatically to the Kernel, including status changes and traffic/error counters as they occur.

The network manager has full control over which nodes are polled, the polling rates, and which remote nodes log events. The Kernel processes the raw data and creates a log file of statistical data which is then available to the NMCC/DECnet Reports subsystem for the production of network reports.

The User Interface subsystem provides an easy-to-use command interface to the NMCC/DECnet Monitor. It provides on-line graphic and lexical video displays of selected error statistics, traffic statistics, and status information. The displays are designed hierarchically so that the user can select the network components, information types, and levels of detail in a consistent and easy to use manner. The graphic displays include histograms, linear scales, and a network map.

The User Interface subsystem also provides the user with the capability to build and manipulate various databases maintained by NMCC/DECnet Monitor, including a network component reference database. This contains a description of all nodes and physical links in the network. It includes such details as CPU type, type and version of operating system, name and telephone number of system manager, name and telephone number of customer service contacts, and many other useful details. Display commands are provided to retrieve this information. The user interface to these commands is consistent with the operational interface of the product.

NMCC/VAX ETHERnim

SPD: 26.96
UPI: 514

NMCC/VAX ETHERnim is a network management application program that provides the network manager with a tool to gather information about Ethernet nodes, verify reachability of nodes, provide a graphical display of local area network topology, and monitor Ethernet traffic.

NMCC/VAX ETHERnim consists of two categories of software. One must be installed on a VMS system set up as the Host, and the other can be optionally installed on Target systems running VMS. In this context, the Host is defined as the node on which the NMCC/VAX ETHERnim application runs, while the Target systems are the DECnet nodes on the Ethernet segments which are being tested at the User (task) level. The optional software installed on the Target system is referred to as the Remote files.

The Host software requires Phase IV DECnet software on a VMS system.

Terminal Server Manager

SPD: 27.64
UPI: VDH

Terminal Server Manager VMS (TSM) software will allow suitably privileged users at a VAX host to control and observe terminal servers anywhere in the extended local area network. TSM provides centralization and increased flexibility in configuring, monitoring, and controlling Digital Equipment Corporation's family of terminal servers.

VAX Disk Striping Driver for VMS

SPD: 31.66
UPI: YEL

VAX Disk Striping Driver for VMS implements disk striping for the VMS operating system. The product provides the ability for users to create one or more stripesets, each comprised of two or more physical disk drives and represented to the user application (and operating system) as a single pseudo-device. Stripesets must be composed of disks of a single type. Full VAXcluster support is provided with Striping V2.0 (with VMS V5.4).

Disk striping interleaves multiple disks to improve I/O performance in the same way that high-performance memory systems interleave memory banks. In each case, data requests are decomposed and distributed to physical storage components that process those requests in parallel.

VAX Jukebox Control Software

SPD: 25.D6
UPI: VHB

VAX Jukebox Control Software (JCS) is a VMS operating system layered product that controls the operation of one or more RV64 optical libraries or jukeboxes. It is intended as a toolkit for applications developers and as a utility for system managers and operators. VAX JCS supplies a callable run-time library interface as well as a Digital Command Language (DCL) interface. Commands are provided that allow the movement of optical disk cartridges into and out of the jukebox, and between storage slots and optical drives within the jukebox. In addition to cartridge movement, a variety of status reports and maintenance commands are supported by VAX JCS.

VAX JCS Run-Time Library routines are intended to be called from user-written programs to perform jukebox functions. Any program written in one of the VMS operating system supported languages can call any procedure in the VAX JCS RTL (Run-Time Library). VAX JCS RTL calls conform to standard VMS systems interface specifications for creating modular procedures, which allow mixed language programming.

VAX JCS is contained in the VAX JCS RTL as a shareable installed image. Only the DCL and callable RTL interfaces are accessible by the user.

VAX JCS provides programmed control that enables the RV64 jukebox to optical cartridges between door, slots, and drives in the jukebox; load and unload optical cartridges to and from the optical drives; flip a cartridge from one side to another; and run calibration and self-test procedures. Functions for locking and unlocking the jukebox are supplied to ensure a controlled environment for any process. VAX JCS also maintains a database for the RV64 that can generate a bitmap for the slots and provide status information.

VAX JCS checks for sufficient user privilege before performing each VAX JCS functions. Higher-privileged processes can unlock a jukebox locked by a lower-privileged process. The system manager can assign system privileges.

VAX Remote Environmental Monitoring Software (REMS)

SPD: 29.73
UPI: VI5

VAX Remote Environmental Monitoring Software (REMS) supports Digital's HA3000 Uninterruptible Power System, H7317 Power Distribution System PLUS (PDS+) and H7318 Power Conditioning System Plus (PCS+) microprocessor based environmental and power distribution systems, and the H7310 Environmental Monitoring System. With the PDS+/PCS+ and/or EMS systems, complemented by the VAX REMS software, complete environmental surveillance of a computer site and supporting equipment is accomplished. In addition, VAX REMS, communicates with the HA3000 UPS to accept alarm and status information from that product's internal sensors.

Through the use of sensors that are both internal and external to the PDS+/PCS+ units, and external sensors in the EMS units, environmental changes are detected, and, depending upon user defined threshold settings for these sensors, notification alarms are triggered on the host VAX system. Optionally, utilizing embedded sensors within HA3000 UPS systems, internal parameters and alarms are retrieved in a time-stamped sequence allowing this information to be included within the VMS file structure created by REMS. VAX REMS provides continuous unattended monitoring and collection of environmental data and will only require attention if an alarm condition is reached on one of its sensors.

Employing an easy to learn and use menu and forms style user interface, VAX REMS facilitates the task of configuring the environmental sensors for a complete system. For status inquiry and alarm notification purposes, VAX REMS generally eliminates the need to use the the H7310 local terminal interface, along with the PCS+/PDS+ and HA3000 consoles.

VAXcluster Console System

SPD: 27.46
UPI: V01

VAXcluster Console System (VCS) is a VMS DECwindows layered software product which provides a central point for system console services and for logging console data received from the serviced nodes. From a single terminal or VAXstation display connected to the VCS host system, a system manager can perform all console functions for all serviced nodes.

Functions include shutting down or rebooting the serviced nodes; running standalone diagnostics; performing standalone backup operations; installing layered products; viewing console output; reviewing historical console data; retrieving historical console data for analysis or printing; and searching for console data.

VCS also logs all data and activities between VCS and the serviced nodes; scans incoming messages from the serviced nodes for specific text strings that can contain status or error information; notifies system managers of critical system messages; enables users to assemble icons (not drawn to scale) into graphics displays on a VAXstation screen representing the aerial view of the data center and the logical grouping of your VAXcluster configurations; and provides an optional security facility to control access to the serviced nodes.

VAXcluster Software

SPD: 29.78
UPI: VBR

VAXcluster Software is a VMS System Integrated Product (SIP). It provides a highly integrated VMS computing environment distributed over multiple VAX and/or MicroVAX CPUs. This environment is called a VAXcluster system.

CPUs in a VAXcluster system can share processing, mass storage, and other resources under a single VMS security and management domain. Within this highly integrated environment, CPUs retain their independence because they use local, memory resident copies of the VMS operating system. Thus, clustered CPUs can boot and fail independently while benefiting from common resources.

Applications running on one or more CPUs in a VAXcluster system access shared resources in a coordinated manner. VAXcluster Software components synchronize access to shared resources, preventing two or more processes from interfering with each other when updating data. This coordination ensures data integrity during multiple concurrent update transactions.

Because resources are shared, VAXcluster systems offer higher availability than standalone CPUs. Properly configured VAXcluster systems can withstand the failure of various components. For example, when one CPU in a cluster fails, users can log on to another CPU to create a new process and continue working. Applications can be designed to survive the failure of one or more CPUs or other components.

Software Product Summary

Product Name	SPD	UPI
3270 Terminal Option Software	25.G5	VV9
ALL-IN-1	27.30	AAA
ALL-IN-1 DESKtop for DOS	50.20	YFE
ALL-IN-1 DESKtop Server for VMS	31.71	YFF
ALL-IN-1 Electronic Authorization and Routing System	34.80	GJ6
ALL-IN-1 MAIL	39.58	VZ8 (For DOS)
	39.59	YFT (LAN) YFU (WAN) YCZ (Server for VMS) YZ7 (For VMS DECwindows) YHS (For Video Terminals)
	39.15	YZJ (Mail for Windows) MCU (PATHWORKS Links) LBJ (PATHWORKS for Windows)
ALL-IN-1 MAIL for VMS	39.59	YFT (Local Area Network Server) YFU (Wide Area Network Server) YCZ (Server for VMS) VZ7 (VMS DECwindows) YHS (For video terminals)
ALL-IN-1 Manager for LANs	36.59	XTJ (Manager for LANs) XTK (Manager for WANs) XTL (Desktop for LANs) XTM (IOS for LANs)
ALL-IN-1 PC Server for VMS	31.71	YFF
ALL-IN-1 Personal Assistant	37.53	MDX
ALL-IN-1 Services for DECwindows	33.22	YG4
ALL-IN-1 STARTER	25.D9	VNN
ALL-IN-1 Voice Messaging Support	26.44	
BASEstar CIMfast for VMS	36.31	XDB (Development) XDC (Runtime)
BASEstar for VMS	33.17	YU9 (Development) YUA (Runtime)
CADRA-VIEW for VMS	33.88	GFY GG1 (View only) GG3 (DXF interface) GG5 (ADT interface) GG7 (IGES) GLW (Translators)
CDA Converter Library for ULTRIX	31.30	VZB (VAX) YG9 (RISC)
CDA Converter Library for VMS	31.31	VZA
CDD/Administrator for VMS	32.72	YP8
DEC ACA Services for ULTRIX	36.07	XKC (VAX development) XKD (VAX runtime) XKE (RISC development) XKF (RISC runtime)
DEC ACA Services for VMS	36.06	XKA (Development) XKB (Runtime)
DEC Ada	21.41	GZQ
DEC Ada Preprocessor for ULTRIX/SQL	33.14	YNR (VAX) YNQ (RISC)
DEC ASD/SEE Toolkit for VMS	37.09	YXZ
DEC AVS for ULTRIX	33.29	YUT
DEC CDA Invokers for VMS	34.91	GVM
DEC C++ for ULTRIX	37.61	MG5
DEC COBOL Preprocessor for ULTRIX/SQL	36.82	XX1

Product Name	SPD	UPI
DEC Commserver for VMS	33.21	GCQ
DEC Computer Integrated Telephony Applications Interface for ULTRIX	34.25	GMU (RISC) GMV (VAX)
DEC Computer Integrated Telephony Applications Interface for VMS	29.92	VGX
DEC Computer Integrated Telephony Server 100/500	36.33	XNQ
DEC C Preprocessor for ULTRIX/SQL	33.10	YNV (VAX) YNU (RISC)
DECdecision	25.G2	VW3
DECdesign	29.29	XD1 (Platform) XAK (Yourdon technique) XAL (Gane & Sarson technique) XAM (MERISE technique)
DECdx/VMS	26.36	708
DEC/EDI	31.70	YM1 (Media/documentation) YM2 (Application component) YM3 (Translation component) YM4 (X.400 comm. component) YM5 (OFTP comm. component) YM6 (Bi-synch comm. component) YM7 (Bi-synch package) YM8 (OFTP package) YMP (X.400 package)
DECelms	31.79	YFP
DECelx Realtime Tools for ULTRIX	37.63	MFN (ULTRIX) MFP (MIPS) MFQ (68K) MFR (MIPS runtime) MFS (68K runtime)
DEC File Optimizer for VMS	36.21	GJ8
DECforms	29.90	VCH (VMS full development) VNS (VMS runtime) GVR (RISC ULTRIX full dev.) GVS (RISC ULTRIX runtime)
DEC FORTRAN for OSF/1	37.54	MD3
DEC FORTRAN for ULTRIX RISC Systems	33.05	VV6
DEC FORTRAN Preprocessor for ULTRIX/SQL	33.12	YNT (VAX) YNS (RISC)
DECframe for RISC ULTRIX	31.83	YGJ YHL (Client) YHJ (Server) YGK (Integration Kit)
DEC GKS-3D for ULTRIX	30.93	VX3 (VAX development) VX4 (VAX runtime) VX1 (RISC development) VX2 (RISC runtime)
DEC GKS-3D for VMS	25.D2	VFX (Development) VFY (Runtime)
DEC GKS for VMS	26.20	810 (Development) 811 (Runtime)
DEC IEZ11 Class Driver for VMS	31.41	YEH
DECimage Application Services for ULTRIX	31.73	YF7
DECimage Application Services for VMS	25.E8	829
DECimage Character Recognition Services for VMS	34.24	GJF
DECimage EXpress	37.41	MBU (Runtime) MBV (Development) MBW (Client) MBX (Server)
DECimage SCAN Software for ULTRIX	31.75	YF8

Software Product Summary

Product Name	SPD	UPI
DECimage SCAN Software for VMS	25.D4	YPF
DECimage Storage Manager for VMS	31.22	893 (Server) YGD (Client)
DEC Image Utility Library for ULTRIX	34.48	GM1 (VAX) GN1 (RISC)
DEC Image Utility Library for VMS	34.47	GL9
DEC InfoServer Client for VMS	33.91	GGW YTC (InfoServer access license)
DECinspect for VMS	26.N1	GKL
DEC InstantSQL for Rdb/VMS	37.60	MEQ
DECintact	29.58	VF1 (Development) VF2 (Runtime) VF3 (Remote access)
DEC LMF PAK Generator for ULTRIX	34.29	GT9
DEC LMF PAK Generator for VMS	31.68	YWP
DECmcc Basic Management System	32.48	YSU
DECmcc Developer's Toolkit	32.49	YSW
DECmcc Director	32.46	YM9
DECmcc Enterprise Management Station	31.88	YFV
DECmcc Extended LAN Manager AM	31.33	GX8 GX9 (License required with DECmcc Director V1.1)
DECmcc Management Station for ULTRIX	33.18	YU1 (VAX) YUG (RISC)
DECmcc Site Management Station	31.87	YGL
DECmcc TCP/IP SNMP Access Module for VMS	32.50	YSV
DECmcc WANdesigner	35.45	YMG
DECmessageQ for MS-DOS	34.06	GHR
DECmessageQ for ULTRIX	34.08	GHU (VAX) GHT (RISC)
DECmessageQ for UNIX	39.25	MK6 (ULTRIX RISC dev.) MKC (ULTRIX RISC runtime) MK5 (ULTRIX VAX dev.) MKB (ULTRIX VAX runtime) MK8 (HP-UX development) MKE (HP-UX runtime) MK7 (System V/88 dev.) MKD (System V/88 runtime)
DECmessageQ for VMS	34.07	GKP (Development) GHV (Runtime)
DECmpp FORTRAN	36.68	XT6
DECmpp Image Processing Library	36.69	XT5 (License and doc.) XT4 (Media)
DECmpp Parallel Programming Environment	36.67	XT7 (License and doc.) XT4 (Media)
DECmpp System Software	36.70	XT4
DECndu (Network Device Upgrade) Utility for ULTRIX	33.48	YX2 (FDDI DECconcentrator 500) YX3 (FDDI DECbridge 500) XA2 (FDDIController)
DECndu (Network Device Upgrade) Utility for ULTRIX/VAX	36.34	YX2 (FDDI DECconcentrator 500) YX3 (FDDI DECbridge)
DECndu (Network Device Upgrade) Utility for VMS	33.47	YX2 (FDDI DECconcentrator 500) YX3 (FDDI DECbridge 500)
DECnet/OSI for ULTRIX	34.97	716 (VAX ULTRIX systems) YT9 (RISC ULTRIX)
DECnet/PCSA Client: VAXmate	55.10	0N7
DECnet Router Server	30.34	725

Software Product Summary

Product Name	SPD	UPI
DECnet/SNA Gateway for Channel Transport	29.76	VC9
DECnet/SNA Gateway for Synchronous Transport	25.C6	S01
DECnet/SNA ULTRIX 3270 Data Stream	30.64	XD2 (VAX) XD9 (RISC)
DECnet/SNA ULTRIX 3270 Terminal Emulator	29.88	022
DECnet/SNA VMS 3270 Data Stream Programming Interface	26.87	363
DECnet/SNA VMS 3270 Terminal Emulator	26.84	454
DECnet/SNA VMS APPC/LU6.2 Programming Interface	26.88	022
DECnet/SNA VMS Application Programming Interface	26.86	455
DECnet/SNA VMS Data Transfer Facility	27.85	VEB (Server) VEK (Utilities) 1GQ (MVS) GUY (VM)
DECnet/SNA VMS DISOSS Document Exchange Facility	26.72	042
DECnet/SNA VMS Distributed Host Command Facility	26.71	043
DECnet/SNA VMS Gateway Management	29.70	VCK
DECnet/SNA VMS Printer Emulator	26.70	044
DECnet/SNA VMS Remote Job Entry	26.85	453
DECnet-ULTRIX for RISC and VAX	26.83	716
DECnet-VAX	25.03	D04 (End-node) D05 (Full-function) D09 (migration option)
DECnet-VAX Extension	29.03	D04
DEC Network Save and Restore for ULTRIX	36.17	MA5 (VAX single-use) GZK (VAX server) MA6 (RISC single-use) GZL (RISC server) XYX (VAX and RISC client)
DEC ODA Compound Document Architecture (CDA)	32.10	YHN
DEComni/VMS (Digital's OSI Manufacturing Network Interconnect)	32.32	YME
DEC OSF/1	36.29	XYW
DECpage	26.29	AAN
DEC Pascal for DEC OSF/1	36.72	XYV
DECperformance Solution Accounting Chargeback	36.60	XTX
DECperformance Solution Capacity Planner	36.04	GX3
DECperformance Solution Data Collector	36.02	GX1
DECperformance Solution Performance Advisor	36.03	GX2
DEC PHIGS for ULTRIX	25.K7	VW6 (Development) VW7 (Runtime)
DEC PHIGS for VMS	29.38	0KB (Development) VK1 (Runtime)
DECplan Client for ULTRIX/RISC	31.29	YPB
DECplan for VMS	33.09	YPB (Server) XC6 (Client) XC8 (Time manager client) XNV (Time manager to client upgrade option)
DECplan Time Manager Client for ULTRIX/RISC	31.28	YPB (Server) XC6 (Client) XC8 (Time manager client) XNV (Time manager to client upgrade option)

Product Name	SPD	UPI
DECpresent for ULTRIX	32.08	YHG
DECpresent for VMS	32.07	YHE
DECquery for Macintosh	34.12	GGC
DECquery for ULTRIX	36.78	MD2
DECquery for VMS	36.77	MD1
DEC RALLY for VMS	27.03	A86 (Development) VF4 (Runtime)
DECram for VMS	34.26	GJ9
DEC RdbAccess for ORACLE on VMS	32.80	YQV
DEC RdbAccess for VAX RMS on VMS	32.88	YQZ
DEC RdbExpert for VMS	31.72	VFJ
DEC Realtime Test Integrator for ULTRIX	32.43	YUQ (Development) YV8 (Runtime)
DEC Realtime Test Integrator for VMS	28.30	YWQ (Development) B15 (Runtime)
DEC Reliable Transaction Router (RTR) for VMS	34.30	XNK (Backend) XNL (Frontend)
DECrouter 2000	28.85	VI8
DECrouter 200	27.72	VDJ (VMS and MicroVMS) VDK (ULTRIX-32) A33 (MS-DOS and PC-DOS)
DECrouter 250	32.15	YG6
DECscheduler for VMS	32.19	YLL
DEC SecurityGate for VMS	36.20	GZF
DEC Security Reporting Facility for VMS	26.N2	GKM
DECserver 100 for VMS and MicroVMS	27.41	925
DECserver 200 for ULTRIX-32	27.54	VDE
DECserver 200 for VMS and MicroVMS	27.53	VCB
DECserver 250 for ULTRIX-32	38.07	VTN
DECserver 250 for VMS	25.J5	VTM
DECserver 300 for ULTRIX-32	25.J2	VTV
DECserver 300 for VMS and MS-DOS	25.J1	VTU
DECserver 500 for ULTRIX	33.54	03K
DECserver 500 for VAX VMS and MicroVMS	26.97	03K
DECserver 90TL for VMS, ULTRIX, and MS-DOS	38.71	MJP
DEC SoftPC for VMS	32.18	YNW
DEC Sound/Picture Information Network (DECspin) for ULTRIX	37.21	MD9
DECtalk Mail Access	26.45	088
DEC Text Processing Utility (DECTPU)	38.42	MC6
DEC TM32 Software for VMS	31.45	VZU
DEC Token Ring Network Device Driver for VMS	36.32	
DECtp Desktop for ACMS	34.81	GZG
DECtrace	25.G1	VW2 (Development) VW4 (Runtime)
DECtrace for VMS	25.G1	VW2
DEC Trellis Object System for ULTRIX	32.39	YLU (VAX) YLW (RISC)
DEC Trellis Object System for VMS	32.40	YLV
DECview3D	26.95	796
DECview3D Concurrent View and Edit Module for VMS	31.35	XWS

Software Product Summary

Product Name	SPD	UPI
DECvoice Software	29.97	VFU
DEC VTX	26.57	031
DEC VUIT (Visual User Interface Tool) for ULTRIX Systems	33.78	GE8
DEC VUIT (Visual User Interface Tool) for VMS Systems	32.09	YHC
DEC Wide Area Network Device Drivers for ULTRIX	32.33	YMK (VAX) YML (RISC)
DECwindows 4125 Emulator for ULTRIX	31.59	YE9 (VAX) YHD (RISC)
DECwindows 4125 Emulator for VMS	31.60	VZQ
DECwindows DECnet/SNA 3270 Terminal Emulator for ULTRIX	31.57	VXA
DECwindows Developer Kit on VMS for OSF/Motif	32.37	YMA
DECwindows Graphical Interface Tools for VMS	32.27	XAQ
DECwrite for ULTRIX	25.K6	YG1
DECwrite for VMS	25.F6	VVF
DECwrite SGML Gateway and Development Tools for ULTRIX	34.78	XSZ
DECwrite SGML Gateway and Development Tools for VMS	34.77	XSY
DEC X.25 Access for ULTRIX	26.E6	YP3 (VAX) GTE (RISC)
DEC X.25gateway 100/500	32.97	YT8
DEC X.25 Native Mode for ULTRIX	32.35	YSZ (VAX) YSY (RISC)
DEC X.400 Mail System for ULTRIX	31.32	YW1 (VAX) YW2 (RISC)
Desktop-VMS Software	25.F4	VV8
Digital Cartridge Server Component (DCSC) for VMS	33.59	YWN
Digital Extended Math Library for VMS	31.67	YEZ
Digital Extended Math Library for ULTRIX	34.44	GKK
DRB32 VMS Drivers	27.69	VF5
DRV11-WA/DRV1W ULTRIX Driver	32.91	YLJ (VAX) YLK (RISC)
DSM DDP-DOS	50.19	YG7
DSM for ULTRIX	33.76	GFF
EDCS II	26.39	518
Ethernet Terminal Server for VMS and MicroVMS	27.39	726
External Document Exchange with IBM DISOSS	26.92	761
FORTRAN IV/VAX to RSX, PDP-11 Cross Compiler	25.17	107
HSC Software	30.52	926
IEX-VMS-Driver	26.30	519
International Lexicons for ULTRIX	31.05	VYL
International Lexicons for VMS	31.04	VYH
Internet Portal	31.61	VZS
IXV11/VMS Driver	28.28	VHZ
KDM70 Software	31.62	YG5
KMV1A LRR Program	28.38	Z74
KMV1A MicroVAX Driver and Development Tools	28.26	VCR
KMV1A MicroVAX Driver and X.25 Link Level Software	28.27	VCQ

Software Product Summary

Product Name	SPD	UPI
KMV1A MicroVAX Driver	28.23	VCP
KMV1A VMS RMJ Link Level Software	30.88	VW9
Language and Specialized Lexicons for VMS	29.61	VI7
LAN Traffic Monitor VMS	27.80	VEH
LCG01 Software	30.46	VJ4
LinkWorks Developer's Tools for VMS	36.26	XAR
Lucid Common Lisp/DECsystem	32.23	YL9
Lucid Common Lisp/VAX for VMS	36.76	XVJ
MicroVAX 2000/VAXstation 2000 Diagnostic Package	25.C3	AGX
MicroVAX Diagnostic Monitor CDROM Maintenance Diagnostic	33.16	K32
MicroVAX Diagnostic Monitor	28.09	ABX
MicroVAX Diagnostic Monitor Ethernet Server	29.89	A07
MicroVAX Diagnostic Monitor RA/RD Kit	31.82	A11
MicroVAX MIRA Switch Control	27.86	09T
MicroVAX VSV21 Support Software	28.20	185
MicroVMS/DRQ3B Device Driver	29.25	0AP
MUXserver 300 Remote Terminal Server for ULTRIX	25.F1	VZH
MUXserver 300 Remote Terminal Server for VMS	25.E9	VT7
MUXserver 320/380 Remote Terminal Server	32.94	YWL
NEXPERT OBJECT for ULTRIX Systems	38.40	XSX (VAX systems—dev.) YEN (VAX systems—runtime) VWK (RISC systems—dev.) YEP (RISC systems—runtime)
NMCC/DECnet Monitor	26.91	VTG (Base system) VM8 (Right-to-copy)
NMCC/VAX ETHERnim	26.96	514
OSI Application Developer's Toolkit	34.98	GZR
Pascal for RISC	33.04	VV4 (Traditional) XLU (ULTRIX ConDist)
PBXserver	29.23	VCC
PDP-11 C for VMS	33.54	03K
PDP-11 DATATRIEVE/VAX	25.14	105
PDP-11 FORTRAN-77/VAX to RSX	26.16	138
PDP-11 Symbolic Debugger/VAX to RSX	26.75	139
PL/I for RISC ULTRIX	36.81	XWZ
PowerFrame for ULTRIX	31.83	YGJ
PowerFrame for VMS	34.73	GTV (VMS workstations and clients) GTX (VMS servers) GTY (Integration kit)
Remote System Manager	29.59	B13 (VMS Server) B14 (VMS Client) VWW (ULTRIX/VAX Client) GUX (ULTRIX/RISC Client)
Session Support Utility	27.79	VE3
SoftPC for ULTRIX	32.17	YP7
Terminal Server Manager	27.64	VDH
TPframe	37.22	MB3
ULTRIX Disk Shadowing	34.27	GZM (VAX) GMP (RISC)
ULTRIX Mail Connection	29.05	VFG

Software Product Summary

Product Name	SPD	UPI
ULTRIX MLS+ Trusted Worksystem Software	34.10	GXR (VAXstation 3100) GNA (RISC)
ULTRIX Operating System	26.40	VEY (VAX) VYV (RISC)
ULTRIX/SQL Remote Access to Rdb/VMS	34.89	YNP
ULTRIX Worksystem Software	28.22	0JQ (VAX) VV1 (RISC)
VAX-11/725/730 Diagnostic Set	25.93	200
VAX-11/750 Diagnostic Set	26.42	201
VAX-11/780 Diagnostic Set	26.41	200
VAX-11/780 Microprogramming Tools	25.09	
VAX-11/785 Diagnostic Set	26.81	210
VAX-11/785 Microprogramming Tools	26.63	
VAX-11 RSX	26.73	382
VAX 2780/3780 Protocol Emulator	25.07	111
VAX 3271 Protocol Emulator	25.21	112
VAX 6000 Diagnostic Set	33.55	K34 (VAX 6000 Models 200, 300, 400) K33 (VAX 6000 Models 500, 600)
VAX 6200/6300 Series Diagnostic Set	25.C9	K12
VAX 6400 Series Diagnostic Set	31.55	K21
VAX 8200/8300 Diagnostic Set	27.81	K10
VAX 8500/8550/8700/8800 Diagnostic Set	27.82	
VAX 8600/8650 Diagnostic Set	26.82	
VAX 8820/8830/8840 Diagnostic Set	25.C7	
VAX 9000 Series Diagnostic Set	32.22	K23
VAX ACMS (Application Control and Management System)	25.50	079 (Development) 076 (Runtime) Y30 (Remote access)
VAX Ada	26.60	056
VAX ADE	25.76	425
VAX APL	25.31	020 XAA (High performance option)
VAX BASIC	25.36	095
VAX BLISS-32 Implementation Language	25.12	106
VAX C	25.38	015
VAX CDD/Plus	25.53	897
VAXcluster Console System	27.46	V01
VAXcluster Software	29.78	VBR
VAX COBOL	25.04	099
VAX COBOL GENERATOR	27.16	365
VAX Computer Integrated Telephony Message Desk	32.06	YG8
VAX Computer Integrated Telephony Server	29.91	VGY
VAX Data Distributor	27.76	VDR
VAX DATATRIEVE	25.44	898
VAX DBMS (Database Management System)	25.48	899 (Development) 915 (Runtime)
VAX DECalc	25.79	310
VAX DECalc/DECgraph Package	27.51	924
VAX DECalc-PLUS	27.37	A98
VAX DEC/CMS	25.52	007
VAX DECgraph	26.07	360

Software Product Summary

Product Name	SPD	UPI
VAX Decision Expert for VMS	25.D5	VI2
VAX DEC/MAP	27.66	VFZ
VAX DEC/MMS (Module Management System)	26.03	VAD
VAX DECscan VMS and ELN Bitbus Drivers	27.98	VCJ
VAX DECscan VMS Software Toolkit	26.98	VCS
VAX DEC/Shell	26.69	143 (1 to 16 users) 144 (32 users)
VAX DECslide	26.11	361
VAX DECspell Verifier/Corrector	26.34	650
VAX DEC/Test Manager	26.68	927
VAX Diagnostic Program Macros Library	26.25	ZE0
VAX DIBOL	25.49	018
VAX Disk Striping Driver for VMS	31.66	YEL
VAX Distributed File Service	28.78	VEQ
VAX Distributed Name Service	28.79	VER
VAX DOCUMENT	27.55	VEE
VAX DSM	25.08	130 YP2 (Runtime)
VAX DT07	25.88	S32
VAXELN Ada	27.22	A97
VAXELN Ethernet Driver/Switch	28.31	
VAXELN KAV Toolkit Extensions for VMS	34.18	GES
VAXELN KMV1A Support Software Package	28.35	Z71
VAXELN KMV1A Tool Kit	29.17	0JP
VAXELN Toolkit	28.02	375 376 (Runtime)
VAXELN Window Server for ULTRIX	33.68	YWR
VAXELN Window Server for VMS	33.69	376
VAX Encryption	26.74	081
VAX FORTRAN	25.16	100
VAX FORTRAN for ULTRIX Systems	27.23	A99 YV7 (High performance option)
VAX FORTRAN High-Performance Option	32.67	YHB
VAX FTAM (File Transfer, Access, and Management)	29.86	VFW
VAXft System Services	31.64	YEA
VAX Genius Driver	25.J9	VUR
VAX Grammar Checker	29.60	VFB
VAX Image/3L Supporting Software for VMS	33.42	PV0
VAX ISDN ACCESS	31.24	VZC
VAX ISDN	31.23	VZ9
VAX ISDN Primary Rate Access D Channel Interface for VMS	33.53	
VAX Jukebox Control Software	25.D6	VHB
VAX KCT32	26.04	128
VAX Key Distribution Center	27.77	03U
VAX KMS11-BD/BE HDLC/BSC Framing Software	26.55	920
VAX KMS11-BD/BE X.25 Link Level Software	25.80	757
VAXlink for IMS and VSAM Client	29.87	VFV
VAX LISP/ULTRIX	27.05	418
VAX LISP/VMS	25.82	917

Software Product Summary

Product Name	SPD	UPI
VAX LN03 Image Support Software	31.52	GXZ
VAX LSE (Language-Sensitive Editor/Source Code Analyzer)	26.59	057
VAX MAILGATE for MCI Mail	27.34	742
VAXmate Services for MS-DOS	55.09	A9A
VAXmate Software for Standalone Use	55.06	0M1
VAX Media Manager	31.40	VZD
VAX Message Router	26.33	732 730 (VMSmail gateway) 733 (Programmer kit)
VAX Message Router/P Gateway	28.94	VCG
VAX Message Router/S Gateway	29.24	VDU
VAX Message Router Telex Gateway	29.96	VAV
VAX Message Router X.400 Gateway	27.50	VDM
VAX Notes	27.06	960 (Server/client) VES (Client only)
VAX OPS5	27.04	913 (Development) MKL (Compiler only)
VAX OSI Applications Kernel	27.47	VD9
VAX Packetnet System Interface Access	27.78	061
VAX Packetnet System Interface	25.40	071
VAX Pascal	25.11	126
VAX PCL	26.23	S33
VAX Performance Advisor	27.71	VE5
VAX Performance and Coverage Analyzer	26.76	119
VAX PL/I	25.30	114
VAX Public Access Communications	28.51	VFH
VAX RALLY	27.03	A86
VAX Rdb/ELN	28.03	D07 (Developmet) D08 (Target system)
VAX Rdb/VMS	25.59	VD2 (Development) VCL (Interactive) 358 (Runtime)
VAX Realtime Accelerator Software (VAX RTA)	29.43	VJN
VAX ReGIS to Sixels Converter	27.88	VEF
VAX Remote Environmental Monitoring Software (REMS)	29.73	VI5
VAX RMS Journaling	27.58	VDV
VAX SCAN	26.93	495
VAX ScriptPrinter Software	27.84	VF9
VAXset Package	27.07	965
VAX Software Performance Monitor	27.56	850 (Full function) VUP (Collector facility)
VAX Software Project Manager	27.52	A82
VAX Source Code Analyzer	27.63	382
VAX Storage Library System	29.67	OL8 (Remote)
VAX System V	33.24	VZZ
VAX System V Volume Shadowing	33.25	VFS
VAX TDMS (Terminal Data Management System)	25.71	706 (Full development) 711 (Runtime)
VAX TEAMDATA	27.02	741
VAX TU70/72 Device Driver	27.09	187

Software Product Summary

Product Name	SPD	UPI
VAXuisx and VWS Migration Tools Kit	33.58	VAW
VAX Volume Shadowing	27.29	AB2
VAX Wide Area Network Device Drivers	29.64	VAW
VAX Xway	27.36	729
VIDA for DB2	25.E7	VTW (Client) VTX (Server)
VMS DECwindows Motif	36.09	XA1 (End user) XDD (Developer)
VMS License Management Facility	36.35	XAN
VMS Operating System	25.01	09S (Base Documentation) 001 (Extended Documentation)
VMS POSIX	34.82	GXX
VMS/SNA	27.01	362
VMS/ULTRIX Connection	25.A4	VHR
VMS Workstation Software	28.06	A96
VS11-VAX Driver	25.45	S28
VXT Terminal Software	31.34	XNG
WPS-PLUS/DOS	30.70	0F2
WPS-PLUS for VMS	26.27	AAM
WPS-PLUS/Workstation	30.51	
X25portal 2000	25.F9	VHU
X25Router 2000	28.86	VIA
XMedia Tools for RISC ULTRIX	36.55	XUV (Tools Developer Kit) XTP (Audio Dev. License) XTR (Video Developer License) XTT (Audio Cluster License) XTT (Software Media) XUW (Tools Full Dev. Kit) XTP (Audio Dev. License) XTR (Video Dev. License) XTT (Audio Cluster License) XTT (Software Media) MB5 (Tools Runtime Kit) LBD (Tools Runtime License) XTQ (Audio Runtime License) XTS (Video Runtime License) MB4 (Software Media)

For information on the following personal computing products refer to Chapter 3, *Personal Computing.*

Browser for Windows	37.42	MCV
Conferencing for Windows	38.65	MCW
DEC MAILworks for DOS	39.58	VZ8
DEC MAILworks for Macintosh		
DEC MAILworks for PCs		
DEC MAILworks for Windows	39.15	XZJ
eXcursion for Windows	37.43	MG7
MOBILIZER for ALL-IN-1	36.95	XWW Server XWX Client
Pacer for ULTRIX		
PATHWORKS Access Solution for TCP/IP		

Software Product Summary

Product Name	SPD	UPI
PATHWORKS Desktop Backup	41.55	MR2
PATHWORKS for DOS and Windows	55.07	0TL
PATHWORKS for DOS (NetWare Coexistence)	34.76	GLV
PATHWORKS for DOS (TCP/IP)	33.45	YV9
PATHWORKS for Macintosh	31.53	YPH
PATHWORKS for OS/2	55.24	YFW Client YLX Server
PATHWORKS for OS/2 (TCP/IP)	36.58	XV7
PATHWORKS for ULTRIX	32.44	YNG
PATHWORKS for VMS	30.50	A93
PATHWORKS for VMS (Macintosh)	35.09	YPH Client YPC Server
Vivace for Windows Version	41.39	

For information on the following printer software, refer to Chapter 8, *Terminals and Printers.*

DECfonts Typeface Collection for VMS and ULTRIX		
DECprint Printing Services for VMS		
DEC PrintServer Client Software for ULTRIX	30.86	VVM
DEC PrintServer Supporting Host Software for ULTRIX	30.85	VVM
DEC PrintServer Supporting Host Software for VMS	27.68	798
DECprint Utility for PostScript to Sixel Printing for VMS	31.56	YZP
Documentation and Publication Management (DPM)		
Freedom of Press		
JetForm Software		
LaserTwin Software—HP LaserJet Series III Emulation		
ON-TAP—Bar Code Printing Software		
PrintAPlot Software—HP Plotter Emulation		
PrintServer Client Software for ULTRIX		
Reggie Software—Mac Graphics Files Converter		
RETOS—VAX ReGIS-to-Sixels Converter	27.88	VEF
SoftFont		
SuperFonts 25/1		
VAX Distributed Queuing Service (DQS)	28.80	VEN
VAX PrintServer Client Software	27.67	797
VAX Vertical Forms Printing		

Digital Services

Overview

Digital, an international company, does more than half its business outside of the United States. There are over 40,000 service professionals that deliver consistent, high-quality service at 450 locations around the world.

More than 15 years of experience creating and supporting networks has made Digital an industry leader. Digital's own EASYnet, which encompasses 40,000 intelligent nodes and serves 100,000 users, provides an ideal platform for testing and refining network tools, products, and services. As a networking leader, Digital is committed to open systems and industry standards. Digital was the first vendor to agree to make its proprietary network architecture comply fully with the Open Systems Interconnection (OSI) model.

Digital has an established track record for creating multivendor networks, supporting third-party hardware and software, and using other vendors' products. With this expertise, solutions that ensure interconnectivity and interoperability are offered for diverse computing.

Digital has a tradition of working cooperatively with other vendors. These alliances ensure that products and services are available to complement Digital's offerings. When expertise is required that is not available from Digital, assistance is requested from a partner.

Consulting Services and Systems Integration experts provide assistance in areas such as manufacturing, distribution, service administration and support, applications development, business systems, datacenter management, and training development.

Digital Services

Open Services

Digital recognizes that consideration of three elements is essential to the realization of open solutions: the business, the people, and the technology. Digital's Open Advantage is to provide services that address all three throughout the life cycle of the solution—from planning and design through implementation and management.

The bottom line is that "open services" is Digital's commitment to do whatever it takes to make sure its customers get solutions that always work—multivendor systems integration, flexibility of choice, consistent standards, and unqualified accountability.

Digital's services are "open." The reason can be summed up in what Digital calls "The Open Advantage," an open technology that treats the customer as a partner, and open services that turn technology into useable solutions—even if they don't include Digital's products.

Digital defines "open services" by these characteristics:

- A single source of responsibility for all support
- Complete support for multivendor environments
- Flexible support tailored to each customer's needs
- Worldwide standards of support, from desktop to enterprise

Systems Integration

Systems Integration (SI) involves applying technology to solve business problems and may require the realignment of organizational structure and business processes so that every aspect of the enterprise—people, technology, and business—supports strategic goals.

As a leading technology vendor and a business innovator, Digital has the resources to implement large-scale SI projects that incorporate multiple projects and span multiple business functions and geographies.

Systems Integration *(Continued)*

Digital's approach to SI includes:

- Dedicated program management
- A comprehensive and flexible program methodology
- Strategic alliances with other market leaders to deliver joint solutions
- Resource centers that focus Digital's vast resources in support of major integration efforts

Industry analysts consistently rank Digital as one of the top five systems integrators in the world.

Consulting Services

Consulting is an integral part of many information technology solutions and provides specialized expertise when and where it is needed—for only as long as it is required.

Consulting Services can include:

- Analyzing current environment and defining overall information needs.
- Designing business processes.
- Developing guidelines and standards for an enterprise-wide information architecture.
- Developing a solution architecture that specifies technologies and applications required to support those business goals.
- Creating a functional requirements definition.

Digital offers four major categories of consulting services:

- **Management Consulting**—helps articulate clear business objectives, develop business processes, and identify technology opportunities.
- **Applications Consulting**—employs industry and applications expertise to define solutions that solve specific problems or support business processes. Services include application analysis and design, selection of an application portfolio, and application programming.
- **Information Technology (IT) Consulting**—provides assistance in designing and implementing enterprise-wide IT systems. Digital's areas of expertise include:
  - database design, implementation, and management
  - transaction processing
  - network planning and design
  - enterprise-wide messaging systems
- Information Service (IS) Consulting – assists in optimizing the use of technology resources. Areas of focus include IS strategy, IS organizational design, and operations planning; Computer-Aided Software Engineering (CASE); and performance, capacity, and security services.

Customized Solutions

Because "off-the-shelf" solutions seldom provide a strategic advantage, custom-designed solutions can provide a competitive edge. Digital has been developing customized solutions for more than 25 years. These solutions include customized hardware, applications, training, and support. Digital brings together a team of professionals with the skills to design and implement a solution to meet defined specifications. Digital's commitment to industry standards and use of proven tools and methods ensure quality, consistency, and long-term supportability.

Customized Solutions *(Continued)*

Examples of custom solutions include:

- Modifying Digital hardware for a special purpose such as "ruggedizing" for use in a harsh industrial setting, or providing more computing power in a smaller footprint.
- Developing a software application that embodies the knowledge of company experts.
- Creating a training solution that teaches students about proprietary information or company-specific procedures.
- Developing a customized support solution that helps an organization improve its service call-handling or its service warranty and service contract administration systems.

Facilities Management Services

Facilities Management Services (FMS) provides the benefit of Digital's experience in managing information systems and datacenters. Computing resources are operated by professionals whose skills are "state-of-the-practice." In addition, FMS can help achieve efficiencies and control costs while providing a higher level of service to internal IS customers.

Warranty, Installation, and Startup Services

Startup period is a critical time; Digital offers a range of warranty, installation, and startup services that ensure an efficient startup and smooth operation during the first year.

Training

Digital's training curriculum addresses the needs of technology planners, technical professionals, and non-technical end users. More than 500 courses are offered, covering a range of technical topics and organizational and professional development training.

Digital training offers the following benefits:

- Convenient training formats
- Training-plan assistance
- Discounts for volume purchases
- 16 languages and at 130 training sites worldwide
- The option to train at a Digital facility or on site

Software Product Services

Digital's family of product support services ensure maximum availability for multivendor systems and applications. Through the combined resources of the U.S. Customer Support Centers and local service offices, Digital delivers remedial and preventive maintenance, advisory support to answer questions and solve problems, technical information, and services to keep computing environments up to date.

For multivendor configurations, Digital provides hardware support for thousands of non-Digital devices when they are are linked to or co-located with a covered Digital system. Software support is also extended to cover non-Digital operating systems and layered software running on Digital hardware.

Advanced Electronic Support (AES) is a key element of product support. AES provides remote diagnosis of system problems; predictive service tools that identify problems before they cause an outage; electronic submission of software service requests; and electronic access to flash messages, software patches, and Digital's extensive product databases.

Digital Services

Network Services

Digital's network services include network integration as well as network support. Skilled network consultants assist in designing and implementing multiprotocol, multivendor LANs and WANs. Digital can design and manage installation of the network physical layer and aid in developing distributed applications.

When comprehensive support is required for a complex network environment, Digital offers network operations management services. These NETsupport Services provide network service tools, service planning assistance, fault isolation and fault resolution management, network configuration management, and network performance monitoring.

PC Integration and Desktop Services

Digital provides complete PC solutions which include the design and implementation of PC networks and the development and delivery of specialized multivendor hardware/software platforms to meet your specifications. Digital also provides ongoing support for PC environments comprising 100 or more systems.

Digital's Desktop Services portfolio provides installation service, on-site and remote maintenance, and telephone software support for the most popular PC hardware and software products. Support is provided on products from respected vendors such as Apple, Ashton-Tate, Borland, COMPAQ, Epson, IBM, Lotus Development Corp., Microsoft, WordPerfect, and Zenith.

Business Recovery Services

Digital can help safeguard computing resources against unpredictable events that can shut down operations for days or weeks at a time. Consultants will assist in designing and implementing an effective business recovery plan for the datacenter, facility, or enterprise.

In case of a disaster, a range of services are available to help return systems to normal operations quickly. Some examples are RESTART Service, which provides access to a backup configuration at a "hot site" to run critical applications. RECOVER-ALL service covers the repair or replacement of equipment damaged during a disaster.

Performance, Capacity, and Security Services

In each of these areas of concern, Digital uses proven tools and methods to assess current computing environments and propose changes that will help meet stated goals.

Both custom-quoted and pre-defined, packaged consulting services are available to help keep systems and networks responsive to evolving business needs.

Digital Assisted Services

Digital Assisted Services offers products, services, and programs to customers who participate in the maintenance of their computer equipment.

Components of Digital Assisted Services include:

- Spare parts and kits
- Diagnostics and documentation
- Tools and test equipment
- Parts repair services, including Field Change Orders
- Off-site product repair
- Other Digital Assisted Services programs

For More Information

Specifications and detailed descriptions on Digital's service offerings can be found in *The Digital Services Reference Guide.* The U.S. version order number is EC-G1726-76.

Leasing Services

Description

As a part of the total solution, the Digital Leasing and Remarketing Group (DLRG) provides financing and leasing alternatives for customers who choose not to pay cash for Digital's products. Whether customers are looking for protection from technology obsolescence, responding to budgetary limitations, or prefer to preserve cash and bank lines for other purposes, DLRG can help customers acquire Digital's products.

DLRG offers services to a wide range of customers: commercial firms, Federal government, state and local governments, schools, non-profit organizations, and prime contractors.

Note: These particular services are available in the U.S. only.

Leasing Plans

- *Capital Lease*—Provides the lessee with a fixed purchase option but with the flexibility of never having to exercise it. The lessee can simply return the system at the end of the lease term. Digital's capital leases are structured with either a 10 percent of the original cost of the system or a $1.00 purchase option. The lessee normally depreciates the assets, as opposed to expensing the monthly rental.
- *Operating Lease*—Complies with FASB 13 guidelines. Terms are normally three or four years, payments level, and purchase and renewal options are at fair market value. The lessee can also return the system at the end of the lease. Pricing assumes certain residual values will be obtained. The lessee normally has a higher regard for accounting issues than ownership rights and is concerned with economic and technological obsolescence of the system in the future. Often referred to as off-balance sheet financing.
- *Total Protection Lease*—A full-service lease that can include extended warranty, RECOVER-ALL, RESTART, and TRANSIT PLUS insurance. This is a convenient fixed-price method of providing full protection for computer installations.
- *Tailored Payment Lease*—Any lease that is structured around specific cash flow requirements. For example, schools may experience heavy cash flows during registration and light cash flows during mid-term. Some industries' cash flows are tied to seasonal products or services. Step payments can be arranged over the term of the lease or decreased payments during the period when cash flow is tight. Digital is interested in providing tailored payment leases that will fit customers' specific cash flow needs.
- *Skip Payment Lease*—These leases are structured with no payments during the initial months of the lease or at annual intervals. Often computer resource needs are not synchronized with budget approval cycles. Lease billings do not commence until the beginning of a new fiscal period or when funds become available.
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